

OAKLAND CENTRAL DISTRICT TRANSIT SYSTEM IMPROVEMENT STUDY

PHASE I

FINAL REPORT

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in association with
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OAKLAND CENTRAL DISTRICT

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ISSUES PAPER

June, 1982

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I. INTRODUCTION

An unprecedented amount of new office, retail and residential space is currently proposed for development within Oakland's Central District. These development proposals, when completed, will establish downtown Oakland as a major transit destination within the San Francisco Bay Area. The City of Oakland, concerned that adequate policies may not exist to react to this increased travel demand, undertook this Phase I study to define the parameters for a Phase II work program directed towards producing a transit development plan for the Oakland CBD. The primary intent of this issues paper is to guide the development of that program.

This study was conceptualized as a program to address basic issues related to transit operations within downtown Oakland: traffic engineering and transit priority treatments to assure continued highly efficient flows of transit vehicles in downtown; realignments of bus routes downtown to assure service to new development sites; minor shifts in level of service on various downtown lines to place capacity on the specific lines where it is most needed; and ways to get from the BART stations to new downtown Oakland building sites. All these points remain important and must be addressed in Phase II. However, the quintessential point which has become evident in the Phase I work is this: the future growth proposed in downtown Oakland is so large (up to 18 million gross square feet of office space over and above the existing 6 million) that major increases in transit operations, including development of funding to support the increases, are needed to effectively service the new downtown Oakland. These changes overshadow the detailed issues of downtown transit operations and accessibility. And downtown Oakland's needs in this regard are not necessarily being adequately addressed in the current planning outlook of the affected agencies.

Accordingly, two types of transit issues have been identified: those of an immediate nature and those related to future growth in the Central District. Additionally, there are a number of transit-related issues that have been identified in Phase I. All of these are discussed briefly in this issues paper. Implications on the Phase II work effort are also discussed below.

II. IMMEDIATE ISSUES

Issues dealing with immediate concerns or problems about Central District transit provisions are in three areas:

- Downtown Transit Operations
- Transit Financing
- Agency Coordination

A. Downtown Transit Operations

Generally speaking, AC Transit and BART provide excellent service to and from the Central District at present. Most destinations within the Central District are within walking distance of AC Transit routes and BART stations, and sufficient capacity is available to meet current peak period transit ridership. (The main exception to this appears to be the BART Concord line.) However, there are a number of issues or concerns about existing downtown transit operations. These are as follows:

1. Broadway Bus Operations: Broadway is the most heavily used street for AC Transit bus service. It carries up to 150 buses per hour (two-way). Bus speeds along Broadway are relatively slow due to the close spacing of traffic signals and the lack of northbound progression. Delays are usually the greatest in the midday period. Other vehicles frequently park or stop in curb bus stops between 12th and 20th Streets. Also, inadequate bus stop space is available near 14th Street.

A number of design treatments have been suggested in the past to improve bus operations along Broadway, including:

- o Transit Mall -- which would prohibit autos and other vehicles from using Broadway, at least during day time hours. (Cross-traffic would be permitted, however).
- o Semi-transit Mall -- which would limit northbound Broadway to buses only but be used by all traffic in the southbound direction.
- o Exclusive Bus Lanes -- which would designate curb lanes in both directions for buses only. Center lanes would be open to all traffic.
- o Relocation of some bus lines to other streets -- candidate streets are Franklin Street, Webster Street and Telegraph Avenue (15th to 20th Streets). Most other north-south streets either are not continuous through the downtown or are not centrally located.

Although this is an existing issue, it should be addressed within the context of future transit needs and operations in the Central District.

2. 14th/Broadway Transfers: AC Transit depends heavily on the presence of convenient transfer locations (both between bus lines and to BART) to maximize overall accessibility and continuity of the system. The 14th/Broadway location is ideally suited to this function given AC Transit's route structure. All but six of the bus lines serving downtown converge in this area. Convenient transfers to and from BART can also be made. On the

other hand, the presence of large numbers of non-CBD persons congregating in sidewalk and plaza areas at building entrances has been cited as a major security problem by affected businesses and the police. While largely a social issue rather than a transit issue, its resolution may require transit service changes. Some possible ways to deal with the issue include:

- o De-emphasize the transfer location by shifting some lines to other north-south and/or east-west streets.
- o Create a new major transfer point elsewhere in the Central District, and re-route bus lines accordingly.
- o Reinforce the existing transfer location, providing facilities to better serve transferring and boarding passengers and enhance the area for others. Development of a Broadway Mall and de-emphasizing of 14th Street as an auto route would support this approach.
- o Re-structure AC Transit bus routes to avoid the need for downtown transfers.

3. Oakland Downtown Shuttle (ODS): The ODS falls well behind other bus routes in the AC Transit system in terms of productivity and farebox revenue. The issues of whether to continue operation of the ODS and, if so, how to improve its performance have been raised. AC transit has proposed discontinuing the service later this year unless additional funding becomes available. Some downtown representatives and BART have proposed service improvements, on the other hand. Suggestions that have been made to improve its ridership include:

- o More aggressive advertising and promotion by AC Transit, BART and downtown merchants
- o Extension to Embarcadero Cove
- o Extension to Grand Lake area
- o Service to Pill Hill
- o Extended evening hours to better serve Jack London Square
- o Additional peak period runs to improve its usefulness as a BART feeder route.

Costs and benefits of these service improvements should be evaluated, and supplemental funding sources identified.

B. Financing Future Improvements

The need for additional capital and operating funds for transit service within the Central District is a key issue that has been raised during this Phase I study. Although funding for transit improvements is largely attributable to anticipated future growth, transit financing is an issue that needs to be addressed immediately. First, given the gloomy

financial outlook for public funds at present, AC Transit will be hard pressed to expand present levels of operation within the downtown in the near future. Secondly, capital or operating expenditures are needed in order to resolve most of the immediate transit issues. And, finally, if the City is to develop alternative funding sources tied to future development, ordinances will have to be established in the near term since many of the proposed downtown developments are now going through the approval process. Once they are approved, it may not be possible to generate such funding on any large scale. Further discussion of these funding issues is given in Section III.

C. Policy Establishment

To respond effectively to the future transportation needs of downtown Oakland, it will be necessary for the City of Oakland, AC Transit and BART to coordinate their efforts. This Phase I study has begun the process on a staff level. Additionally, a number of compatible policies will have to be established by each of the agencies regarding downtown Oakland transit provisions, and this suggests the need for policy level interaction as well. Key policy requirements that have been identified in Phase I include:

1. A mode split policy that defines a target for future usage and relates this to complementary traffic and parking policies for the Central District.
2. A downtown transit priority policy by the City of Oakland to ensure that efficient transit vehicle operations are maintained and enhanced at the higher levels of transit operation and higher levels of auto and pedestrian conflict that will occur as downtown Oakland grows.
3. An AC Transit service policy to give high priority to increasing downtown Oakland transit capacity in the future as ridership demand increases. Ultimately, it will be necessary to increase the overall amount of service to downtown Oakland by increasing overall AC Transit operations and/or by re-allocating services from other AC transit service areas.
4. A BART service policy to expand system capacity into and out of downtown Oakland in the future. To support this policy, BART should evaluate options for using the third track in downtown Oakland, as well as review feeder (suburban) station access needs to meet the potential growth in downtown Oakland.
5. A transit financing policy to support the above policies, including consideration of alternative private sector funding sources.

The above policies involve the City of Oakland, AC Transit and BART. Therefore, delineation and implementation of a consistent set of policies for downtown Oakland transit service will require the participation of all three agencies. Designation of a policy-level transportation task force would facilitate this process.

It would be desirable to clarify some of these policies prior to Phase II in order to focus the Phase II work effort. If not possible to do so, Phase II should consider alternative futures depending on which policies are established later.

III. ISSUES RELATED TO FUTURE GROWTH

A survey of all known development proposals for the downtown area indicates that there are some 18 million gross square feet (gsf) of offices on the drawing board today, or over double the amount of office floor area (8 million gsf) now available in the CBD. Additionally, about 1,000 hotel rooms and up to 1,500 residential units are under construction or proposed as well as almost 2 million gsf of retail uses (including the proposed Capwell Center).

Individual project schedules call for the bulk of the development to be completed and occupied within the next 10 years. A cursory review of market growth rates projected by others, however, suggests that up to 8 million gsf could be absorbed in downtown Oakland within the next 10 years. Hence, this Phase I analysis considers two development scenarios: 8 million gsf as the low level alternative, and 18 million gsf as a high level alternative. The latter represents an accelerated rate over current market projections or, alternatively, a longer-range planning horizon. Conversely, the lower rate represents a growth rate more consistent with recent market projections or, alternatively, a shorter-range planning horizon.

Increased future travel demand to and from the downtown was projected for each development scenario and the potential impacts on AC Transit, BART and the traffic/parking system estimated. The following results were obtained;

- o AC Transit -- significant overall transit capacity deficiency (PM Peak) at the 8 million gsf level assuming no capacity increase. Spreading of the peak period beyond an hour would be necessary in order to avoid overcrowding. At the 18 million gsf level, a net increase in bus capacity would be needed, even with maximum spreading of the peak hour, in order to avoid overcrowding.
- o BART -- At the 8 million gsf development level, peak hour loads on the critical Daly City to Concord line would slightly increase relative to the present. (This assumes completion of planned BART system improvements to permit up to 24 trains to operate per hour transbay as compared to 15 per hour at present, thereby substantially increasing BART's seating capacity.) At the 18 million gsf development level, peak loads would exceed BART's service standards by 25 percent, which indicates extreme overcrowding on some runs. Part of the increase in both cases is due to the projected downtown Oakland growth and part is due to an assumed 50 percent ridership increase on the Concord line due to growth in San Francisco and elsewhere.
- o Traffic and Parking -- With 8 million gsf of new development, several downtown access/egress routes are projected to be overcongested, including intersections toward the northeast, the Nimitz Freeway and streets leading to the Webster tube. There could also be a peak deficit of up to 6,000 parking spaces by then. (This assumes construction of on-site spaces as currently proposed, but no additional off-site spaces over today). With 18 million gsf of new development, locations of overcongestion would be more widespread and more severe, and the peak parking deficit could approach 14,000 spaces.

The projections, although order-of-magnitude only, serve to scale the potential future transportation needs of downtown Oakland. They bring to bear a number of transit issues to be addressed, as described below.

A. Appropriate Role of Transit

The appropriate role for transit versus the automobile in serving future development is of paramount importance. This affects the amount of transit capacity needed, as well as complementary traffic circulation and parking improvements to support a given downtown development level. The above projections of future impacts presuppose significant shift toward transit use.

A substantial parking deficiency is projected even with the increased use of transit. In the absence of development of more parking, it is conceivable that further shift toward transit could--and perhaps should--occur. However, AC Transit and BART may be very hard pressed to supply even the needed capacity implied by the assumed mode split level, let alone a higher one. This is particularly so in the case of the high development scenario. Conversely, if it is not possible to sufficiently expand transit service to the downtown, a still greater number of parking spaces (and associated roadway improvements) would need to be constructed. If neither transit nor parking is expanded, downtown Oakland could lose competitive edge with other employment centers, and potential for new development in the future could be constrained to well below the amount now being proposed in the Central District. The most reasonable approach toward resolving this key issue is likely to be recognition that no single transportation mode is going to satisfy the total new demand. Therefore, further downtown planning should specifically address the relationships among land use development, public transit service and auto facilities.

B. AC Transit Capacity Increase

AC Transit's current draft short-range plan does not anticipate any overall system expansion over the next five years. Moreover, there is an unfunded deficit in the projection of current level operations that may require, in addition to fare increases, service reductions in the future.

In the absence of any funding for expansion of service capacity to the downtown, the projected AC Transit ridership growth of 50 - 120 percent would more than use up any existing surplus in downtown transit capacity and would result in a substantial overall deficiency of bus capacity on downtown lines.

There are a number of ways that AC Transit might be able to increase downtown capacity without increasing the system-wide level of operations:

- Shifting service from one CBD route to another.
- Shifting service from non-CBD routes to CBD routes.
- Shifting service from non-peak period to peak period service.
- Assignment of higher capacity vehicles to downtown service.

- Shortening of individual routes by means of transit centers (CBD end) or park-and-ride stations (outer end).
- Transit preferential treatments on CBD access routes.
- Modification of service on lines paralleling BART routes.

There are numerous technical and policy constraints on AC Transit implementing such service changes. In any service adjustments, the fundamental technical issue is that to increase service in one place, service must be reduced elsewhere. To justify shifting service to specific CBD route(s), it will have to be shown that the new CBD service will be more productive than the service it replaces. On major lines, it is often impractical to shorten the routes to any significant extent and, the amount of bus capacity made available by reducing bus service in BART corridors is minimal due to the need to maintain local bus service between BART stations.

The issue of reducing service also has to be addressed on a policy level. AC Transit's policy is to provide certain minimum service levels and accessibility throughout the District. Service adjustments may be in conflict with this policy in some instances. Similarly, AC Transit's objective is to achieve a certain minimum level of productivity (e.g., passengers per bus-mile) on each line. Even if it can be demonstrated that productivity would increase by placing service elsewhere, it may not be acceptable to do so if the existing line is meeting current productivity standards. Moreover, service cutbacks to achieve productivity increases may conflict with other objectives, such as maintaining adequate accessibility for transit dependents.

AC Transit staff therefore are not optimistic that any substantial capacity increase to downtown Oakland can be achieved in the future without overall expansion of the system and hence additional funding.

C. BART Capacity Increases

BART provides sufficient overall capacity to and from downtown Oakland at present. However, the Daly City-Concord and Daly City-Fremont lines have high load factors. Ridership growth, both region-wide and in downtown Oakland, is projected to outstrip BART capacity, even with the planned 70 percent increase in capacity. This will result in excessively high load factors on some lines. PM peak period riders attempting to board at downtown Oakland stations will be particularly affected as outbound seats and standing room will be already occupied by San Francisco commuters.

Four related issues have been identified that should be addressed either within Phase II or in concert with Phase II:

1. How to Increase BART System Capacity for Oakland Commuters: The planned 70 percent capacity increase does not necessarily represent ultimate BART system capacity. BART is beginning a two-year System Performance Study designed to determine how to optimize the capacity and performance of the existing system. There is an opportunity—and a need—to coordinate the BART study with Phase II of the Central District study to ensure that the scope of the BART study addresses the downtown Oakland capacity problem, and in turn that the Central District study reflects realistic opportunities and constraints for BART service in the CBD.

One major issue that is apparent relates to use of the third track (KE) now under construction. It may be possible in the future to utilize the third track for revenue service during short periods (less than one hour) so as to enable BART to run trains between Oakland and Concord without transbay service. For longer periods, this would require either constructing a fourth track through downtown Oakland for reverse direction deadheading; running the trains all the way to the Hayward yard; or extending the third track further west for temporary storage of trains near the Oakland West station.

2. Downtown Oakland BART Station Access: BART has recently adopted station access plans for all stations, including the three downtown Oakland stations. Adopted recommendations for the three downtown Oakland stations do not necessarily reflect the potentially higher levels of development now being proposed in the Central District. Station access plans should be reviewed in light of most current development plans and revised if needed to better reflect the current development prospects.

Additionally, the issue of pedestrian linkage to downtown BART stations will need to be further addressed in Phase II. This could include consideration of minor sidewalk and street crossing improvements, as well as more costly pedestrianways to major development sites such as Kaiser Center and Capwell Center.

3. Background BART Growth: Future passenger load factors at downtown Oakland BART stations are highly dependent on the rate of growth of non-Oakland destined traffic. For purposes of scaling transit needs herein, a 4.1 percent annual growth rate in peak period BART ridership was assumed for non-Oakland traffic on all lines. Oakland ridership growth was superimposed onto this. An issue that needs to be addressed in Phase II is whether, given the high levels of growth explicitly projected for downtown Oakland, the background growth rates on some or all BART lines should be reduced, since to some degree any growth taken up by Oakland will reduce growth potential elsewhere.

4. BART Capital Improvements Beyond 1987: BART capital improvement funding is largely committed through 1987. Beyond 1987, BART should address the issue of whether BART should fund extensions to the system or instead focus on increasing line capacity of the existing system such as at the Oakland Wye. The ongoing System Performance Study may aid in dealing with this issue.

D. AC/BART Service Coordination

As BART capacity is increased in the future, it may be possible and desirable for AC Transit to modify bus routes which parallel BART corridor service, either by shortening them to become BART feeder lines or by discontinuing them altogether. This would free up equipment and drivers for CBD service. This is particularly the case in lesser used BART corridors such as the Richmond-San Francisco lines at the present time.

The recent AC Transit/BART Coordination study of the Richmond Corridor is a step in this direction. These efforts should be continued and strengthened in the future as BART capacity increases and as CBD demands on AC Transit grow. There are conflicting issues to be addressed, however:

1. BART Capacity: Some corridors will continue to require the combined capacities of AC Transit and BART in the future, due to line and/or station capacity limitations of

BART. The Transbay Terminal Study, for example, projected significant increase in demand for AC Transit's transbay service despite BART service increases.

2. Transit Coverage and Service Levels: BART does not serve the MacArthur Freeway corridor nor portions of the Berkeley and Oakland hills area, for example, as effectively as other travel corridors. Caltrans is currently studying high occupancy vehicle (HOV) lanes from the MacArthur Freeway at Route 24 to the Bay Bridge Toll Plaza. These facilities could increase AC Transit capacity and speeds and hence further favor AC Transit Transbay service in this corridor.

3. AC Transit Financing: This is a critical issue, particularly in considering Transbay service coordination. AC Transit farebox ratios (i.e., recovery of operating costs from fares) are higher for Transbay service, even on the more marginal routes, than for other services. Hence, any shifting from Transbay service to Oakland CBD service, for example, could adversely impact AC Transit deficits.

E. Downtown Transit Operations

Several issues related to downtown AC Transit operations have been noted previously as immediate issues. These issues need to be addressed within the context of existing and future development patterns and levels of transit operation. Moreover, there are a number of other such issues that are related to future development. These are discussed below:

1. General Transit Service Concepts: Existing service concentrates most AC Transit service along Broadway, with a major transfer point at the Broadway/14th intersection (which is also a BART/AC transfer point). A fundamental issue--one that will affect most of the other issues about downtown operation--is whether the existing east-west and north-south transit corridors will continue to be the most effective way of serving the downtown in the future. Factors that need to be considered are the locations of employment centers; street continuity, width and operating speeds; traffic and pedestrian conflicts; and the like. Alternatives to consider include:

- o Maintaining existing corridors (and possibly upgrading them to give transit vehicles priority);
- o Shifting service to parallel routes that better serve future land use patterns;
- o Dispersal of downtown routes to provide downtown grid system;
- o Re-orienting most service into one direction only (e.g., along Broadway) with peripheral transfer points;
- o Focusing transit service into a downtown transit center; and
- o Operating a downtown loop (either as part of the trunk routes or using a separate circulation system) with transfers at CBD cordon points.

2. Downtown Transit Terminal vs. Through-Routing: AC Transit's current route pattern favors through-routing of lines within the downtown. (Exceptions are five lines that

terminate at Kaiser Center and six lines that terminate in Jack London Square). The concept of operating a downtown transit terminal has been suggested in the past. Whether a downtown terminal is preferable over through-routing depends largely on downtown distribution needs, through ridership volumes and patterns, availability of candidate sites, impacts on bus operations, and capital costs.

3. Transit Priority Streets: With increased auto and truck volumes competing for limited downtown street space, it may be desirable to provide preferential treatments for buses on some downtown streets. These could include exclusive bus lanes (either with-flow or contra-flow); bus malls where all auto traffic except cross-traffic is banned during certain hours; or new rights-of-way for exclusive use by transit. (The latter treatment is probably not appropriate in downtown Oakland as no right-of-way opportunities exist). A major potential conflict posed by transit preferential treatment is impacts on other street functions (auto circulation, truck loading, parking, driveway access). Hence, this issue equally impacts AC Transit and the City of Oakland.

Candidate streets for transit priority based on current bus volumes include Broadway (discussed previously), 14th Street, and portions of Webster Street, Franklin Street and Telegraph Avenue. Others may also be candidates if AC Transit routes are relocated in the future. To address this issue specific treatments need to be developed for candidate streets and evaluated in terms of impacts on bus operations and impacts on auto circulation and capacity, truck loading, parking, property access and pedestrian conflicts.

4. Downtown Transit Facilities: As development occurs, it will become increasingly important to ensure adequate provisions for transit in the downtown. Examples are bus passenger loading zones, shelters, street geometrics to accommodate bus operations, exemptions from turn prohibitions, and the like.

5. AC Transit Feeder Service to BART Stations: There are three downtown BART stations: 12th Street, 19th Street and Lake Merritt. Two other stations are just outside the CBD: Oakland West and MacArthur. Most AC Transit routes are oriented toward feeding the 12th Street station. There is an issue of whether AC Transit feeder service to BART should be re-oriented in the future as downtown activity levels increase, compounding existing congestion at the 14th/Broadway intersection. BART has raised the question of whether AC Transit feeder service should be more oriented toward the MacArthur and West Oakland Stations which are more appropriate as major transfer locations. This is particularly so in the case of any AC Transit Transbay service from the Nimitz or MacArthur corridors being re-oriented into BART feeder lines.

6. Service to Jack London Square: Presently, about six local bus lines plus the ODS terminate in Jack London Square. Plans for major office, hotel and commercial expansion have been announced that would greatly increase the need for transit service over today. Sufficient passenger capacity appears to exist. However, the Jack London Square area is physically separated from the Central CBD, and also spread lineally over a mile, and these factors pose special problems for maintaining transit access. Moreover, the preliminary development plans do not incorporate specific provisions for transit service. The issue posed here is whether to continue and add to the number of routes now terminating in Jack London Square or to terminate these routes in the central downtown area and instead operate a local feeder line (such as the ODS) from the terminal location to Jack London Square.

7. Pill Hill: There is an issue of whether the present study area boundaries should be extended to include the Pill Hill area. Lack of good access from Pill Hill to the CBD has been cited as a problem, as there are three major hospitals in the general area. AC Transit has considered extending one or more routes now terminating at Kaiser Center up to Pill Hill, but does not consider it viable. Access could be improved by extending the Downtown Shuttle route north or operating a separate shuttle in conjunction with or in addition to the existing MacArthur BART Station shuttle operated by the hospitals. Questions posed by this issue are what amount of new ridership could be generated, what would be the most cost-effective way of serving the demand, and who would operate and/or pay for any added cost of operation.

F. Financing Future Improvements

Substantial additional capital and operating funds are potentially needed for transit, traffic and parking improvements to service either of the projected CBD development levels. These costs would be borne primarily by the City of Oakland, AC Transit and BART. The comprehensive downtown plan--of which transit is a key element--must reflect realistic financing potentials and limitations for each affected agency. In light of the gloomy financial outlook for public funds at present, a thorough investigation of all possible funding sources, including the private sector, is critical to the overall Phase II study. Sources to be considered include:

1. Public Transit Agency Funding: AC Transit may face substantial unfunded operating deficits in the immediate future due in part to cutbacks in Federal funds, effects of Proposition 13 in limiting property tax revenues, and the like. Similarly, BART may face unfunded capital needs in the future. The new development in the Central District would generate some additional property tax revenue to the Districts. Even so, it is highly unlikely that in the immediate future either agency will be able to fund major capital improvements or service expansion in the Central District. Even with continued fare increases, the AC Transit may be hard pressed to continue present service levels let alone expand operations and BART may have difficulty in funding all of its planned system capital improvements.

2. City of Oakland Funding: The City of Oakland is facing funding cutbacks that will greatly limit its ability to fund any transit improvements in the downtown out of general funds. The City of Oakland, however, will financially benefit from the new Central District development due to increased property tax base, sales tax returns, hotel taxes and residential spending within the City. Most of the Central District is designated a redevelopment area; therefore tax increment financing is a possible funding source for downtown improvements. The City should address the issue of whether a portion of the increased revenues to the City should be applied by means of tax increment financing toward mitigating the increased transit demand due to development.

3. Alternative Funding Sources: Most alternative funding sources are from the private sector, and involve either taxes or fees of some kind. The City of Portland, for example, utilizes payroll taxes to support transit service. The City of San Francisco has recently approved two new fees: an office space fee of \$5.00 per square foot, and a Special Benefit District Fee to be charged annually at about 30¢ per square foot. However, both of these fees are being challenged in court. The main question here is whether the private sector in Oakland would support such fees earmarked toward transit service

expansion in the Central District and what effect this would have on Oakland's attractiveness to further development. A second question is how much money can be generated by such fees.

IV. TRANSIT-RELATED ISSUES

Transit service both influences and is influenced by other components of the downtown and its transportation system. Four types of issues that relate directly to downtown transit provisions have been identified:

- o Land Use planning
- o Traffic circulation
- o Parking policies
- o Transportation system management

A. Land Use Planning

The primary function of transit in the downtown is to facilitate the desired land use pattern and intensity by ensuring the needed level of access. However, transit can in turn serve as a means of attracting desired land uses and channeling these into a serviceable pattern. Conversely, land uses must be located and developed in patterns which make transit service feasible. Given these interrelationships, the Phase II transit study should be integrated with land use planning as part of a more comprehensive Central District Development Plan and Program.

Several questions about future land uses can be posed that directly bear on transit provisions:

1. What degree of transit dependency should be promoted for downtown development? Current zoning regulations in the central portion of the downtown imply heavy reliance on public transit since a maximum floor area ratio is not specified nor is parking required. Is this implied policy and if so, for what portions of downtown is it appropriate, and what levels of transit improvements are necessary to support the policy?
2. What is an appropriate pattern of land uses to facilitate transit usage? The availability of underutilized land in the core area to support over 33 million square feet of development over that currently proposed suggests the opportunity to direct land use patterns to optimize transit service. Should jobs be clustered to a greater extent on the downtown BART stations and/or along Broadway to enhance transit corridor service? Should residential uses be encouraged on the east side of the Central District so as to reduce commuting into the area and create off-peak ridership? Should parking be concentrated west of Broadway so as to intercept traffic from I-980 and minimize traffic crossing Broadway? To what extent can the City channel future land uses, and what mechanisms can be used?
3. What is an appropriate level of downtown growth for use in planning of transit service improvements? What planning horizon(s) should be considered in Phase II, and what levels of development could occur during these periods?

B. Traffic Circulation

There is the need for developing a comprehensive circulation system that most effectively provides for efficient movement of both autos and transit vehicles in the future; that establishes priority functions of each street; and that provides good access to existing and future development. Specific issues include:

1. Street continuity: The existing street system lacks continuity except on a few routes, particularly across Broadway and in the north-south direction. Future developments are likely to increase the pressure for closing streets, while concurrently putting more demands on the remaining ones. What effects will this have on transit routing?

2. Freeway access: The planned I-980 extension to the Nimitz Freeway is likely to re-orient much of the auto traffic into east-west corridors with freeway access, of which there are few at present, while not altering the basic circulation patterns for transit service. This may present opportunities for concentrating major traffic volumes into specific high capacity east-west corridors, while emphasizing transit circulation, local access, and truck loading along north-south corridors.

3. Increased competition for street space: Growth in auto, truck and pedestrian traffic due to future development will greatly increase the competition with transit vehicles for available street and sidewalk space. What effects will this have on bus operating speeds in the downtown? What measures are needed and possible (e.g., bus preferential treatments) to maintain efficient operations?

C. Downtown Parking

The amount and location of parking in the downtown will directly impact the need for transit services in the future. This raises several questions about future parking provisions:

1. How much future parking can and should be provided in the future? As noted earlier, a CBD-wide deficit of 6,000 - 14,000 parking spaces could occur based on the two development levels considered. This is over and above the spaces being proposed on-site within the various proposed developments and assumes some shift toward greater use of transit than at present. Failure to implement the needed transit improvements would increase the dependency on autos, thereby further increasing the number of parking spaces needed to support the projected development levels.

2. How much parking should be provided on-site? Current zoning regulations do not require the provisions of parking on-site within the central area of downtown. Current proposals for on-site parking satisfy only 1/3 to 1/2 of the projected demand, even when considering a relatively high transit mode split. The effects of on-site parking provisions on development cost and the potential share of the regional office and retail market captured by downtown Oakland must be carefully considered in reviewing the current policy for on-site parking provisions.

3. Where should off-site parking be located? It may be appropriate to channel future parking into areas west of Broadway so as to intercept I-980 traffic. There may be a need to consider transit service to connect these peripheral parking areas to employment centers east of Broadway.

4. How should parking be financed, and how will this affect transit financing? Given the overall bleak picture for transportation funding on the part of public agencies, this is a critical issue. At an assumed cost of \$10,000 per space (excluding land cost), the 6,000 - 14,000 space deficit represents a total capital cost of some \$60 million to \$140 million. In addition to competing with many of the same funding sources as used for public transit

improvements, parking improvements could potentially be financed by revenue bonds. Another potential source may be in-lieu fees for developers that do not or cannot provide sufficient parking on-site.

D. Transportation System Management

The issue of how much transit service needs to be provided to the downtown in the future is not simply a question of transit vs. auto. Some transportation system management (TSM) policies and actions can also reduce the peak hour demand for transit without increasing auto driving and parking to the downtown and at relatively little cost. Two general kinds of actions are supportive of this objective.

1. Ride-sharing programs: Ride-sharing encompasses transportation services that involve pre-arranged sharing rides for persons with similar and regular travel patterns. Included are carpools and buspools, and they are usually directed toward the longer distance commute market.

2. Work Hours Program: The basic objective of this program is to spread the time employees arrive and leave over a longer period, thereby reducing peak capacity requirements on the transportation system. Work hours spreading can be facilitated and promoted by adoption of employer-based flextime staggered work hours programs. Both BART and AC Transit have considerable reserve capacity on either side of the peak hour. However, BART is constrained in that parking lots at many suburban stations fill up quickly in the AM period, discouraging usage after the AM peak hour.

V. PRELIMINARY CONCLUSIONS

A number of preliminary conclusions have been drawn by the Consultant based on the foregoing issues. These are intended to provide a starting point for discussion and for guiding the development of a Phase II Work Program.

1. There appears to be the need for establishing a policy-level task force, comprised at a minimum of the City of Oakland, AC Transit and BART, to deal with transit and transit-related policy issues of mutual interest. Community input should also be sought and encouraged.
2. In the absence of established transit policies for the Central District, Phase II must be broad enough to consider effects of different policies on downtown transit provisions.
3. The need for potentially major increases in AC Transit and BART passenger capacity to downtown Oakland must be addressed in light of the unprecedented amount of development currently proposed.
4. The proposed development will occur gradually over time. Therefore, Phase II should consider both short-range (5 years) and longer-range (10-15 years) planning horizons.
5. There are also a number of issues related to existing transit operations. These should be addressed early in the process, but within the context of longer-range transit needs.
6. A number of the transit issues and opportunities extend beyond the Central District boundaries. It may be desirable in a few cases (e.g., Pill Hill access, MacArthur and Oakland West BART station transfers) to include these in the Phase II effort. In other cases, the City of Oakland should lobby for and support AC Transit and BART efforts to deal with the issues.
7. Phase II transit planning should be integrated into a more comprehensive Central District planning effort that also addresses transit--related issues, such as land use, traffic and parking. This is particularly important in light of the possible magnitude of future growth in the Central District. A comprehensive downtown plan, if accomplished now, can serve to guide that growth as well as ensure that the necessary steps are taken toward developing the necessary transit and other transportation improvements to support it.

APPENDIX A Background

A. The Study Area in Perspective

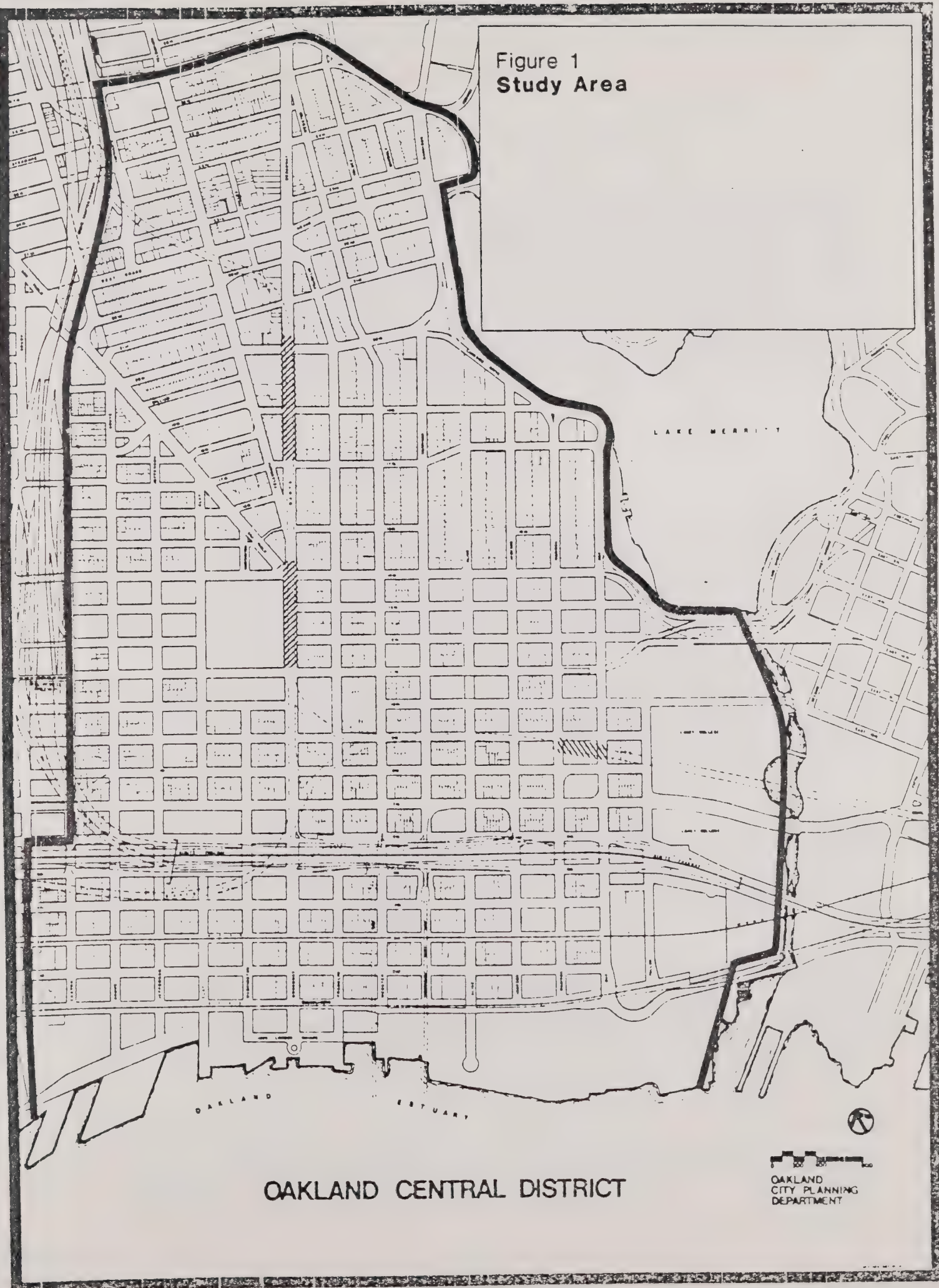
The focus of this study is the Oakland Central District (CBD), boundaries of which are shown in Figure 1. This paper therefore limits itself to issues that relate specifically to CBD transit provisions, and takes an advocacy role in discussing them. To define the opportunities and constraints for downtown transit service, however, the regional context of the CBD must also be understood. The study area is at the geographic center of the Bay region, and is the hub of the East Bay. The regional highway and rail systems radiate from the downtown area. The area is also at the center of the region's rapid transit system (BART), with all lines merging in the downtown.

In terms of activity level, however, the Central District has traditionally taken a "back seat" to downtown San Francisco. Because of this, San Francisco has developed as the transit hub of the Bay region. Even though Oakland is at the physical center of the BART system, the San Francisco CBD is BART's primary origin/destination, with Oakland being only a secondary stop. The AC Transit system, although an East Bay subregional service district, currently provides more commuter service to San Francisco than to downtown Oakland. This service pattern is a direct and reasonable reflection of the relative numbers of District residents currently employed in the two downtowns. However, this report speaks to a possible future time when development and jobs in downtown Oakland may approach 60 percent of those in downtown San Francisco today. Only about 20 percent of the current San Francisco work force resides in the AC Transit District. Roughly 60 percent of the future Oakland work force may reside in the AC Transit District. So in the future, demand for AC commute services to downtown Oakland could be 1.75 times that on the District's current services to downtown San Francisco. Despite the simplistic assumptions underlying the above statement, the conclusion is undeniable: if the level of downtown Oakland development considered herein takes place, a massive increase in AC's downtown Oakland focused operations, particularly commuter oriented operations, will be necessary. A similar shift in scale of demand for Oakland service on BART can be anticipated.

Other transit systems in the region lack service to downtown Oakland. Examples are the Golden Gate Bridge, Highway and Transportation District, which operates bus and ferry service from San Francisco to Marin and Sonoma Counties, and SamTrans and the Caltrain systems serving Peninsula-San Francisco travel. As downtown Oakland grows as an employment concentration, convenient linkages to or direct service from these other sub-regional systems will become increasingly needed.

A parallel situation exists with respect to the highway system. Approaches to downtown Oakland on Highway 17 from the north Highway 24 from the east and Highway 580 from the southeast are congested by a substantial volume of San Francisco oriented traffic. Only on the approach in the Highway 17 corridor from the south is this situation not the case.

Figure 1
Study Area



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This concentration of activity has continued in San Francisco, with office growth there being more rapid in the past 5 or 10 years than ever before. There are signs, however, that more of the regional growth may turn towards Oakland and other East Bay centers in the future. This is evidenced by the unprecedented number of developments now being considered for downtown Oakland and other areas outside San Francisco. Contributing factors appear to be the relatively high rental costs in San Francisco; the increasing congestion on the transit and highway system serving that city; and the availability of housing in the East Bay. How much of the regional growth that downtown Oakland can capture -- and support -- will depend largely on the ability of the transportation systems, particularly transit, to absorb this growth, making Oakland another major destination within the region.

B. Existing and Planned Transportation System

I. AC Transit

The AC Transit District provides bus service throughout major portions of Alameda and Contra Costa Counties, as well as transbay service to a terminal in San Francisco. The system operates East Bay local and express routes, transbay routes, and contract services to areas outside District boundaries. Downtown Oakland is a major hub for AC Transit routes, being served by 19 local lines, 7 express lines and 2 transbay lines. All of the express lines and 5 of the 19 local lines terminate within the CBD.

Figures 2 and 3 show generalized bus routes, indicating downtown corridors for local and express/transbay services, respectively. Within the downtown, bus service is concentrated along Broadway, although a number of express routes use northbound Franklin Street rather than Broadway. Up to 150 buses per hour operate along Broadway. Another major downtown transit corridor is 14th Street, which carries up to 50 buses per hour.

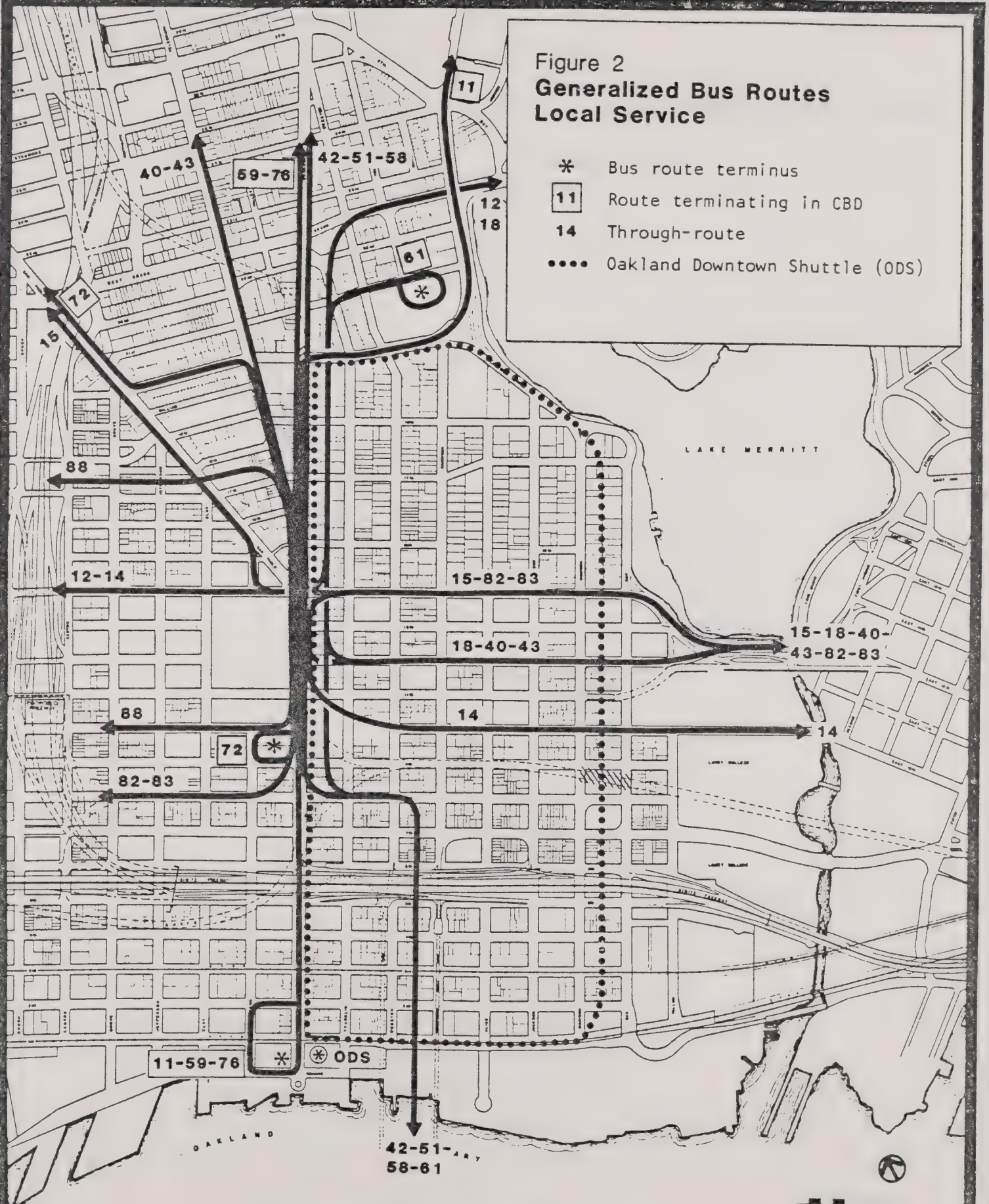
Although constrained by lack of street continuity to operating on only a limited number of through streets, AC Transit provides service within reasonable walking distance of most downtown destinations. The Oakland Downtown Shuttle (ODS) circulates around the downtown area in a two-way loop and supplements off-peak transit service to Jack London Square and the County Offices. Virtually all of the local bus routes within the downtown also provide feeder service to BART, primarily at the 12th Street station.

Table 1 and Figure 4 summarize available data on PM peak period/peak direction load factors* for downtown bus routes crossing the CBD cordon. The CBD cordon conforms to the Central District boundaries shown previously in Figure 1: I-980 on the west, 27th Street on the north, Lake Merritt and the canal on the east, and the estuary on the south. The table indicates that AC Transit has sufficient total seating capacity across

* Ratio of number of passengers to number of seats. Ratio greater than 1.0 indicates standees.

Figure 2
Generalized Bus Routes
Local Service

- * Bus route terminus
- 11 Route terminating in CBD
- 14 Through-route
- Oakland Downtown Shuttle (ODS)

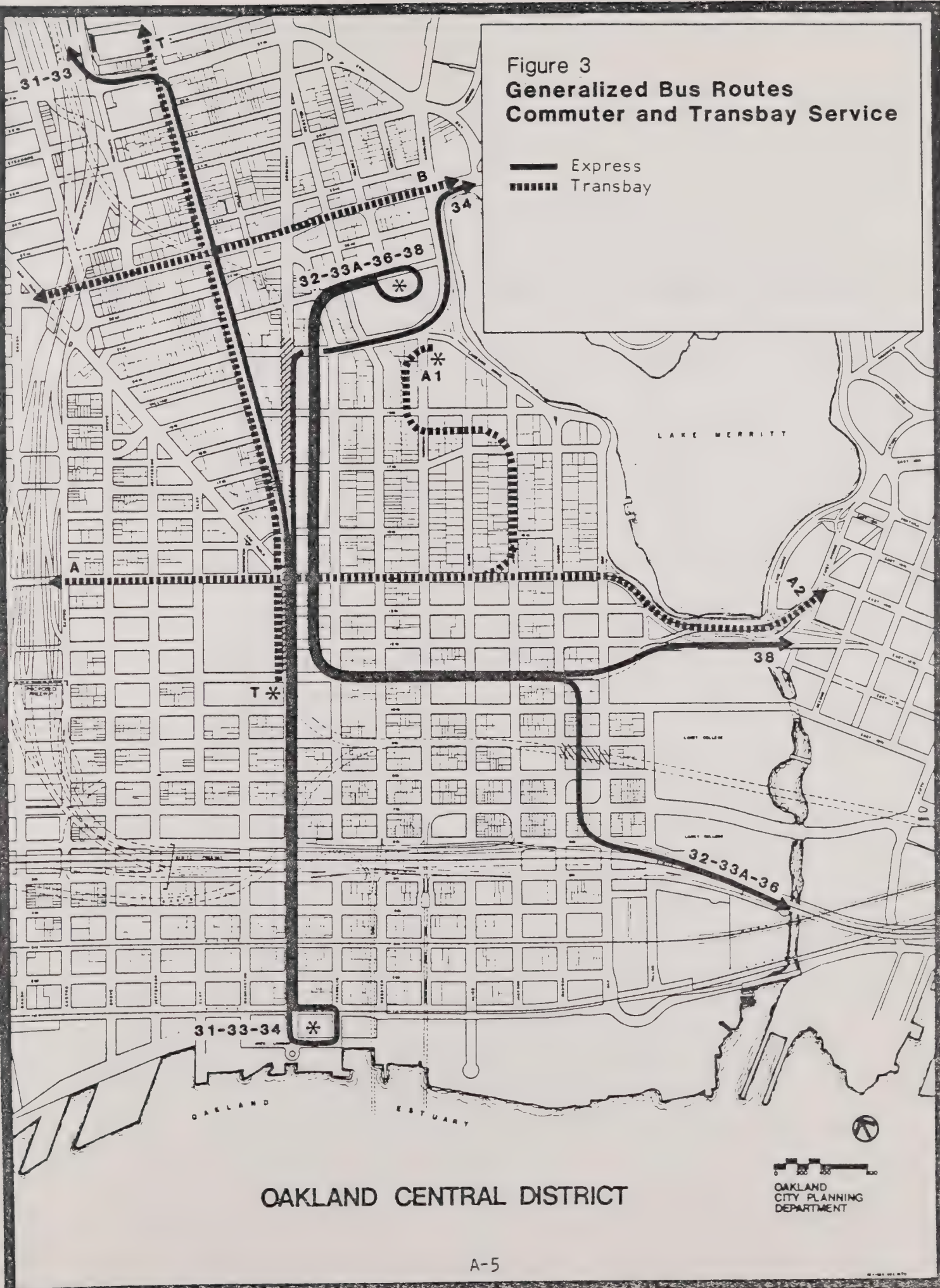


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Figure 3
Generalized Bus Routes
Commuter and Transbay Service

— Express
- - - - - Transbay



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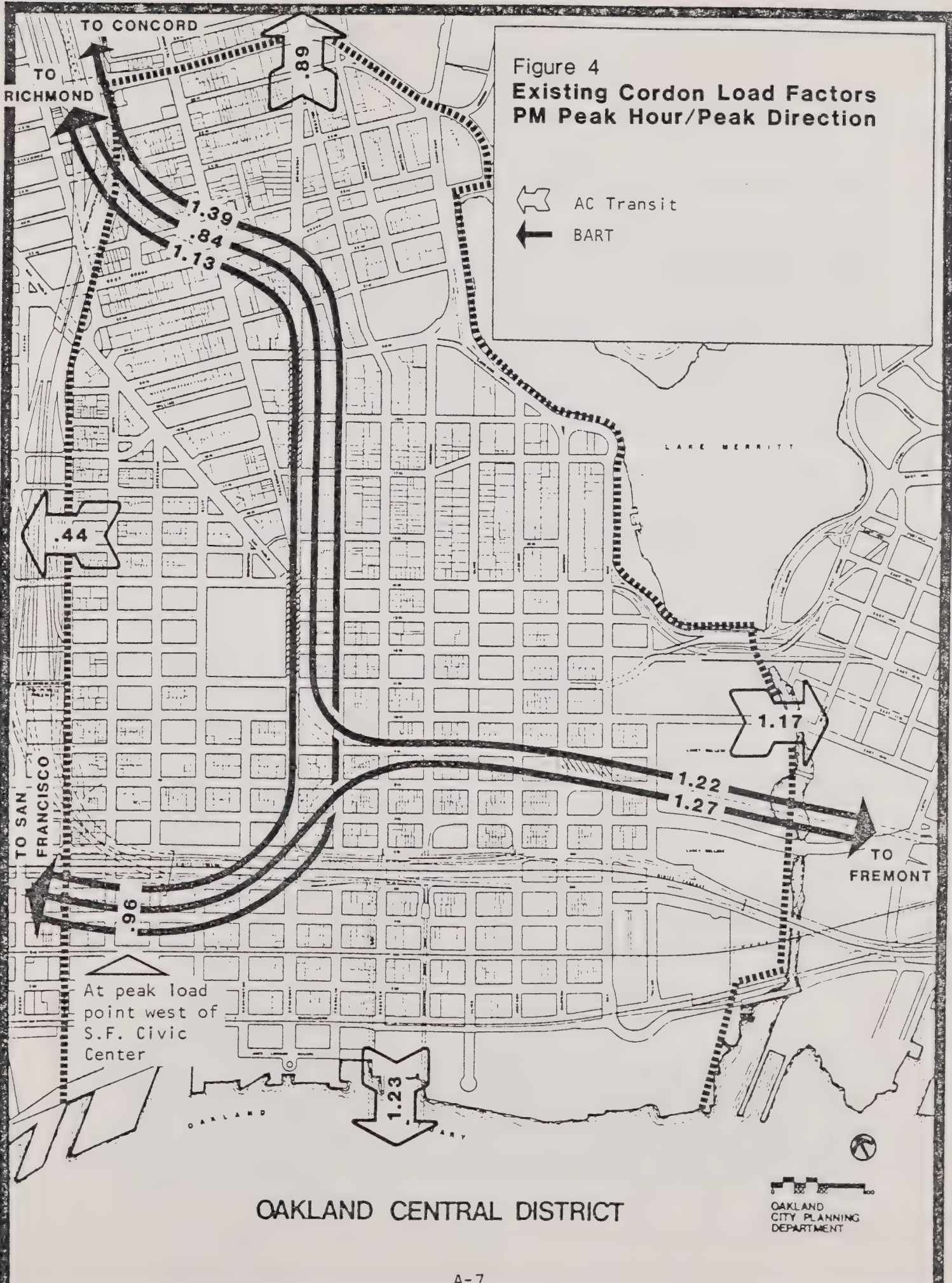
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Table 1
EXISTING AC TRANSIT LOAD FACTORS
PM Peak Hour/Peak Direction

Cordon	Lines	Buses	Seats*	Passengers	Load Factor
1. West	A,12,14, 82,83,88	25	1250	550	.44
2. North	B,T,11,15 31,33,40,42 43,51,58,59,72,76	50	2500	2250	.89
3. East	A,B,12,14,15 18,32,33A,34 36,38,40,43,82,83	70	3500	4100	1.17
4. South	42,51,58,61	<u>13</u>	<u>650</u>	<u>800</u>	<u>1.23</u>
TOTAL/AVERAGE CBD		158	7900	7700	.97

* Assumes 50 seats/bus

Note: See Text for underlying assumptions



the CBD cordon as a whole but that standing is required at some locations during the PM peak hour.

One of AC Transit's present service objectives is to keep load factors under 1.25 during the peak half-hour on any bus route. This means 12 or less standees on a typical 50-seat bus. It is a relatively high service standard for an urban transit system. (San Francisco's Muni, for example, has a service objective of 1.50 over the full peak hour.) According to the previous table, PM peak hour load factors are below 1.25 on all parts of the CBD cordon. However, the 1.25 load factor is closely approached on bus lines to the south (Alameda). Also, the service objective may be exceeded during individual half-hour or one-hour periods at some locations. Even so, considering that the service objective is relatively high, that service headways are short and that route coverage is good, AC Transit would appear to be generally providing a good level of service to the CBD today.

The major constraint on AC Transit at this time relates to financing. While labor and other costs have risen, revenues from all levels of government have declined or are declining, and increased fare revenues have not been sufficient to offset the loss of non-fare revenues. Consequently, AC Transit has programmed no service expansion in the next five years, and instead is considering ways to increase productivity and reduce costs.

2. BART

The BART system provides rapid transit service within Alameda, Contra Costa and San Francisco Counties. The three East Bay legs converge in downtown Oakland before crossing the bay in a single line to San Francisco. Consequently, downtown Oakland is at the "physical center" of the system and has direct no-transfer access to all legs of the system.

There are three BART stations in the CBD: 12th Street, 19th Street and Lake Merritt. Being downtown stations, they all rely heavily on transit and walk access; no on-site parking is provided except at the Lake Merritt station where about 250 parking spaces are available.

Table 2 summarizes existing load factors at critical BART local points affecting downtown Oakland commuters. BART load factors are shown previously on Figure 4. BART's service objective is to keep load factors at or below 1.30 during the peak hour. This load factor is slightly exceeded on the Daly City to Concord line and closely

* Peak hour passenger counts were not available for the lines in question. The load factors were therefore estimated from passenger counts previously taken by AC Transit and DKS Associates at various times throughout the 3-6 PM period. For lines where counts were lacking, load factors for other lines crossing the cordon point were used. To allow for peaking within the PM period, average hourly volumes were increased by 50 percent. Resulting values, aggregated by direction, are shown in the table.

Table 2
EXISTING BART LOAD FACTORS(1)
PM Peak Hour/Peak Direction

Checkpoint Location	Route	Seats	Passengers	Load Factor
MacArthur Station	Daly City to Concord	4,169	5,813	1.39
	Daly City to Richmond	1,339	1,507	1.13
	Fremont to Richmond	1,498	1,256	0.84
Lake Merritt Station	Daly City to Fremont	2,959	3,768	1.27
	Richmond to Fremont	1,368	1,671	1.22
San Francisco Civic Center Station (2)	San Francisco to Daly City (All routes)	6,199	5,946	0.96

(1) Source: BART Weekday Load Factors, April-June, 1981

(2) Peak load point for westbound passengers from San Francisco CBD

approached on the Daly City to Fremont line. Particularly on the Concord line, the high load factor is a problem for downtown Oakland commuters since all seats are taken by San Francisco commuters in the PM peak period. Eastbound Oakland commuters are able to board only because a roughly equal number of passengers disembark in downtown Oakland at the same time.

A number of capital improvements are underway or planned in the near future to increase system capacity and improve reliability. One such improvement, now under construction, is a third track (KE line) through downtown Oakland. The third track is initially planned for "side-tracking" disabled trains so as to minimize service disruptions. Other improvements include:

- o Construction of a Daly City turnaround,
- o Acquisition of more transit cars,
- o Train control system upgrading,
- o Vehicle fire hardening.

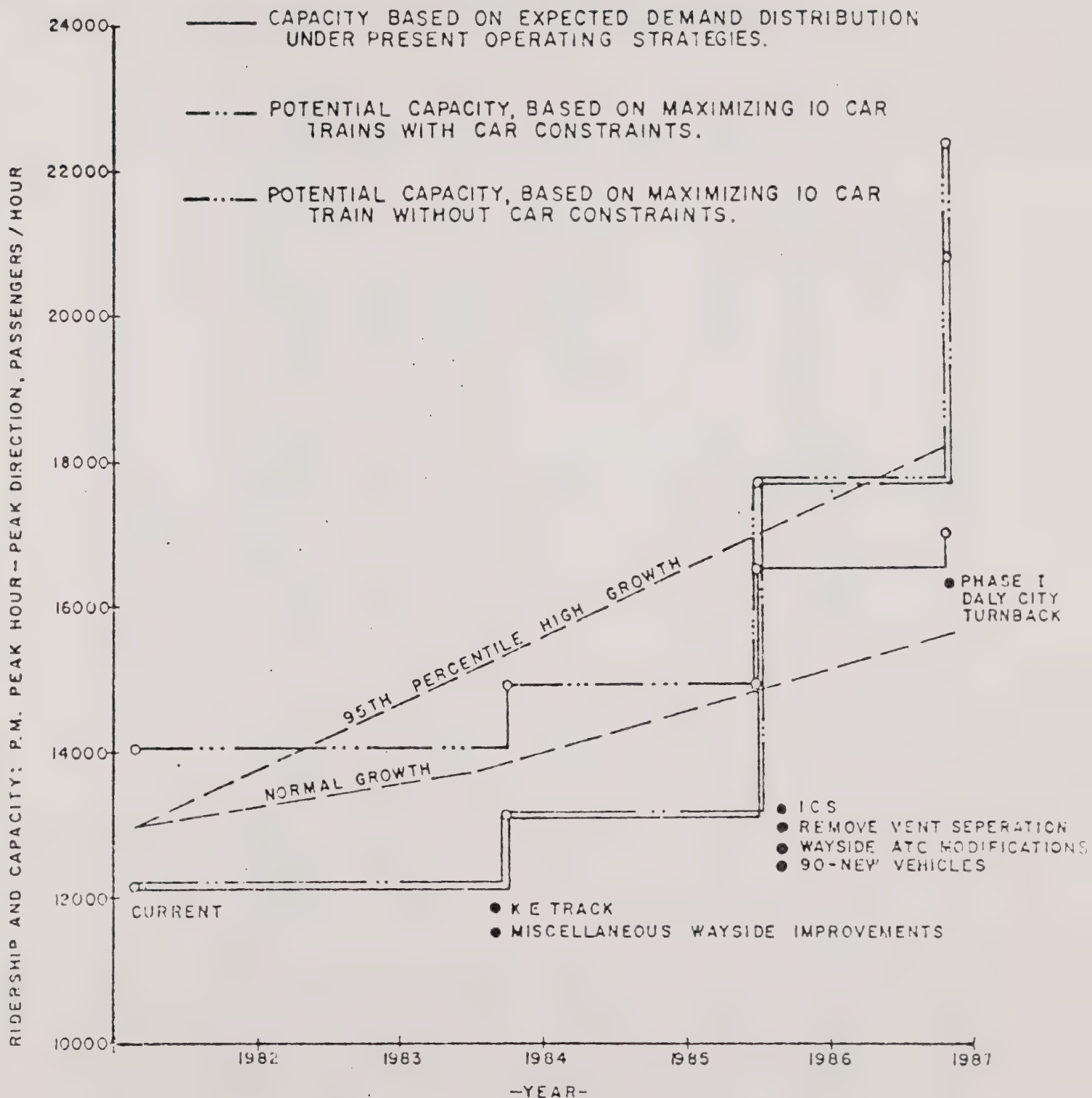
These various improvements, when completed in 1987 or shortly thereafter, are projected to increase capacity by about 70 percent over today, and this would benefit the entire system, including downtown Oakland. Figure 5 shows the capacity effects of the programmed improvements to 1987, as well as BART's projections of transbay ridership growth during the period. Figure 5A indicates what this capacity increase means in terms of peak headways and trains on-line.

3. Other Services

Other transit operators within the Oakland Central District include Greyhound, Continental Trailways, and Peerless Stages.

Figure 5

Projected Increase in BART Capacity



TRANSBAY RIDERSHIP & SYSTEM CAPABILITIES (WITH PLANNED REPROVEMENTS REQUIRED TO ACHIEVE 1.3-MAX. LOAD FACTOR OBJECTIVE.)

SOURCE: BART DRAFT SHORT-RANGE TRANSIT PLAN, MAY 1981

FIGURE 5A
PROJECTED BART TRANSBAY CAPACITY GIVEN VARIOUS CAPACITY IMPROVEMENTS
(P. M. Peak Hour - Peak Direction)

PROJECT	DATE	TRANSBAY HEADWAY (min.)		TRAINS ON-LINE		POTENTIAL CAPACITY		FLEXIBILITY AND RELIABILITY
		MINIMUM SUSTAINABLE	SCHEDULED	TRANSBAY ¹	SYSTEMWIDE ²	W/CAR CONSTR. (1.3 l.f.)	W/O CAR CONSTR. (1.3 l.f.)	
• Present	2-81	3.5	3.75	15	42	12,168	14,040	
• KE Track • Miscellaneous Wayside ATC Improvements	6-84	3.25	3.75	16	46	13,104	14,976	• Facilitating Maintenance • Reducing disruptions in service
• Integrated Control System • Removal of Vent Separation • 90 New Vehicles • Wayside ATC Modifications	6-86	3.0	3.125	19	53	17,784	17,784	• Increase train monitoring capacity • Reduced passenger wait time • Increased capacity
• Daly City Turnback • Phase I	11-86	2.25	2.5	24	65	20,779	22,464	• Increased capacity • Improved train storage

1. Peak-hour throughput

2. During the peak cycle

Source: 1981 BART District Short Range Transit Plan (1981-86), Final Draft

- o Greyhound--the Greyhound depot is located at San Pablo Avenue just north of 20th Street. It serves an estimated 1,100 daily passengers arriving or departing on an average day. The depot is directly served by two AC Transit lines. It is about 1/3 mile to the nearest BART station and to the various AC Transit lines operating along Broadway.
- o Continental Trailways--The Trailways terminal is located at the northwest corner of 20th Street and Telegraph Avenue. It serves an average of 400-500 daily passenger arrivals and departures. The depot is directly served by several AC Transit lines along Telegraph Avenue and is also within a block of AC Transit service and the BART station on Broadway.
- o Peerless Stages--This company operates out of the Greyhound depot at San Pablo Avenue and 20th Street. It serves an estimated 250 passengers per day.

All of these operations, as well as AMTRAK, are being considered for relocation into a proposed inter-modal transportation terminal adjacent to the Oakland West BART station outside the Central Business District. Feasibility studies* are now underway, but it is too early to speculate as to whether the project will be carried out at some time in the future.

4. Traffic Circulation and Parking

Downtown traffic circulation and parking both influence the operation and use of transit services, and have therefore been briefly assessed.

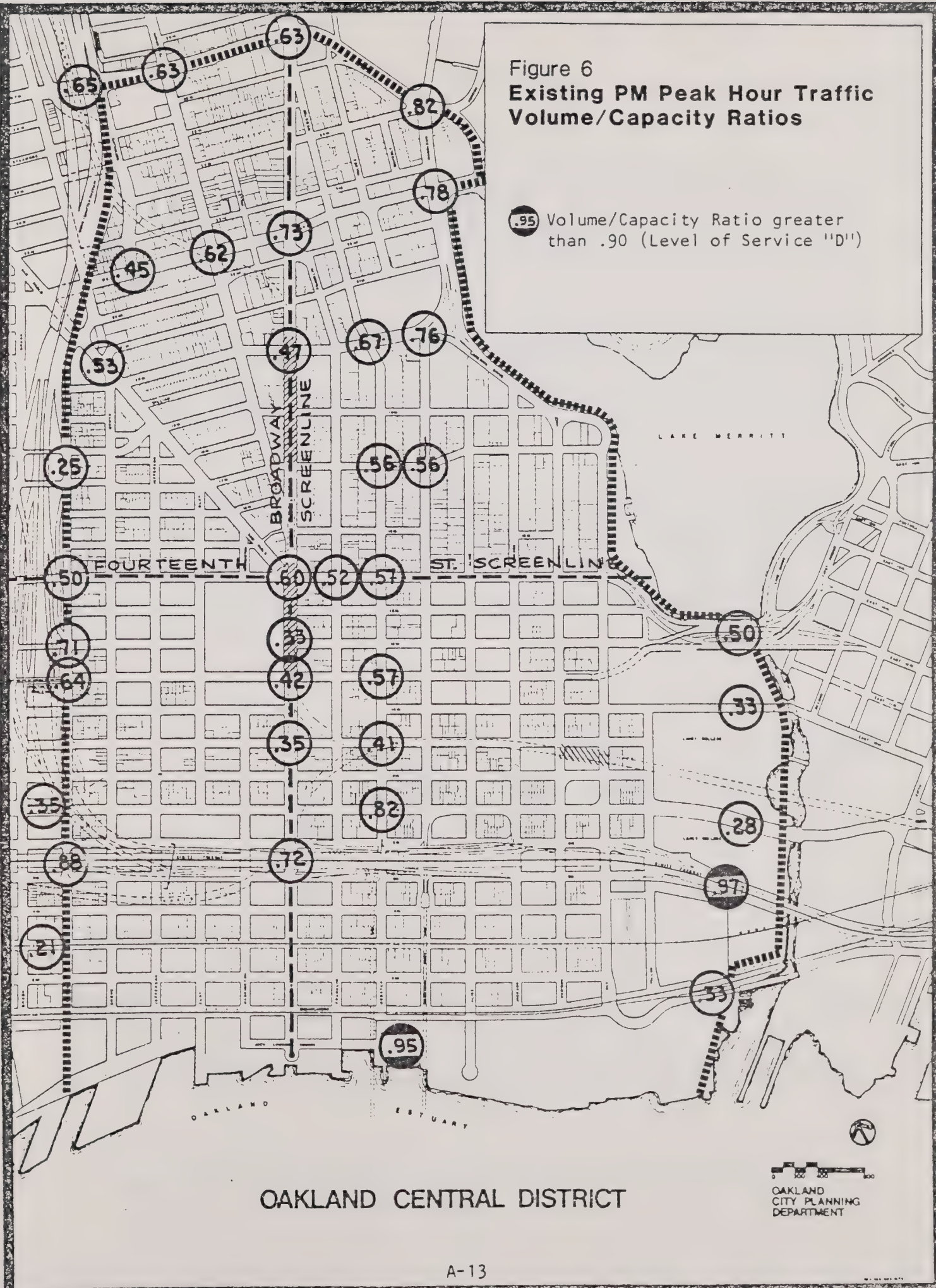
The downtown traffic circulation system is essentially a grid system of streets (see Figure 1 above). A number of discontinuities exist, however. On the east side, Lake Merritt and the canal form a physical barrier, limiting east-west travel to just a few major streets and the Nimitz Freeway. On the west end, the major street system is essentially defined by available crossings and access points to I-980 Freeway, the southern part of which is now under construction. Street continuity to the south is limited by the Nimitz Freeway, portions of BART and the Webster/Posey Tubes. To the north, only Broadway, the historic entrance to the CBD, is truly continuous, although Harrison Street and Telegraph Avenue are alternative access routes. Significant internal discontinuities also exist, particularly across Broadway. These are caused in part by San Pablo Avenue and Telegraph Avenue which run on the diagonal, and in part by street closures within the City Center area.

In spite of these discontinuities the existing traffic circulation system generally works well at present. Figure 6 presents PM peak hour/peak direction volume/capacity (v/c) ratios for all major routes crossing the CBD cordon, as well as the two internal screenlines. V/C ratios less than 0.90 indicate Level of Service "D" or better and are considered acceptable traffic service for the peak hour. Cordon V/C ratios are based on

* Preliminary Feasibility Analysis of the Oakland Transportation Terminal Project, JHK & Associates, February, 1982.

Figure 6
Existing PM Peak Hour Traffic
Volume/Capacity Ratios

.95 Volume/Capacity Ratio greater
than .90 (Level of Service "D")



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generalized arterial and freeway capacities while the screenline V/C ratios were determined by analysis of individual intersections* (and are likely more accurate). Although there are a few isolated locations of traffic congestion during peak period, no locations surveyed operate at worse than level of service "D" during the PM peak hour except the eastbound Nimitz Freeway and the Webster tube access. Both of these routes appear to be operating at close to capacity.

Circulation patterns are undergoing a change, however, with extension of I-980 southerly to connect with the Nimitz Freeway. With this extension, more CBD traffic from the north will likely enter the CBD via east-west streets (e.g., 11th, 12th, 14th, 17th, 18th) rather than via north-south streets as before. The lack of east-west continuity may therefore pose problems in the future. Some existing through-traffic may be removed from City streets by the planned freeway to freeway interchange, although this has not been quantified.

Parking likewise poses no apparent problems in the downtown area at present. Very rough estimates, based in part on recent surveys, are that spaces are only 80 percent full at peak times throughout the CBD as a whole (see Table 3). Assuming about 20,000 total spaces (on- and off-street) and that up to 95 percent peak occupancy is achievable (allowing for turnover of spaces), there may be a reservoir of up to 3,000 spaces in the CBD as a whole. However, there are localized areas and times of parking deficiency (as evidenced by the Merchants Garage, for example), and surplus spaces tend to be concentrated on the fringes of the CBD.

Table 3
EXISTING CBD PARKING

	<u>Spaces</u>	<u>Peak Occupancy</u>	<u>On Street</u> <u>Peak</u> <u>Spaces</u> <u>Occupancy</u>	<u>Off-Street</u> <u>Peak</u> <u>Spaces</u> <u>Occupancy</u>	<u>Total</u> <u>Peak</u> <u>Occupancy</u>
Kaiser Center Area	1600	80%	5500	85%	7,100
Transpacific, City Center Area	<u>1500</u>	<u>84%</u>	<u>3700</u>	<u>81%</u>	<u>5,200</u>
Subtotal-Surveyed Area	3100	81%	9200	83%	12,300
Estimated Total CBD*	5000 ±		15,000 ±		20,000 ±
					80%

* Order of magnitude estimate based on percent of CBD area not covered in surveys.

* Source: EIR's for Kaiser Center and Transpacific Centre, DKS Associates, 1982.

C. Potential Downtown Growth

I. Projected Land Use Patterns and Growth

Land use considerations are discussed in detail in Appendix C. A survey of all known development proposals for the downtown area indicates that there are some 18 million gross square feet (gsf) of offices on the drawing board today, or over double the amount of office floor area (8 million gsf) now available in the CBD. Of this, about 1 million gsf have been approved or are under construction. Additionally, about 1,000 hotel rooms and up to 1,500 residential units are under construction or proposed as well as almost 2 million gsf of retail uses (including the proposed Capwell Center). Depending on employment densities for these future developments, on the order of 66,000-96,000 employees could be added within the CBD upon full occupancy.

Locations of the projects are shown on Figure 7; individual projects, along with planned completion dates and floor areas, are listed in Table 4.

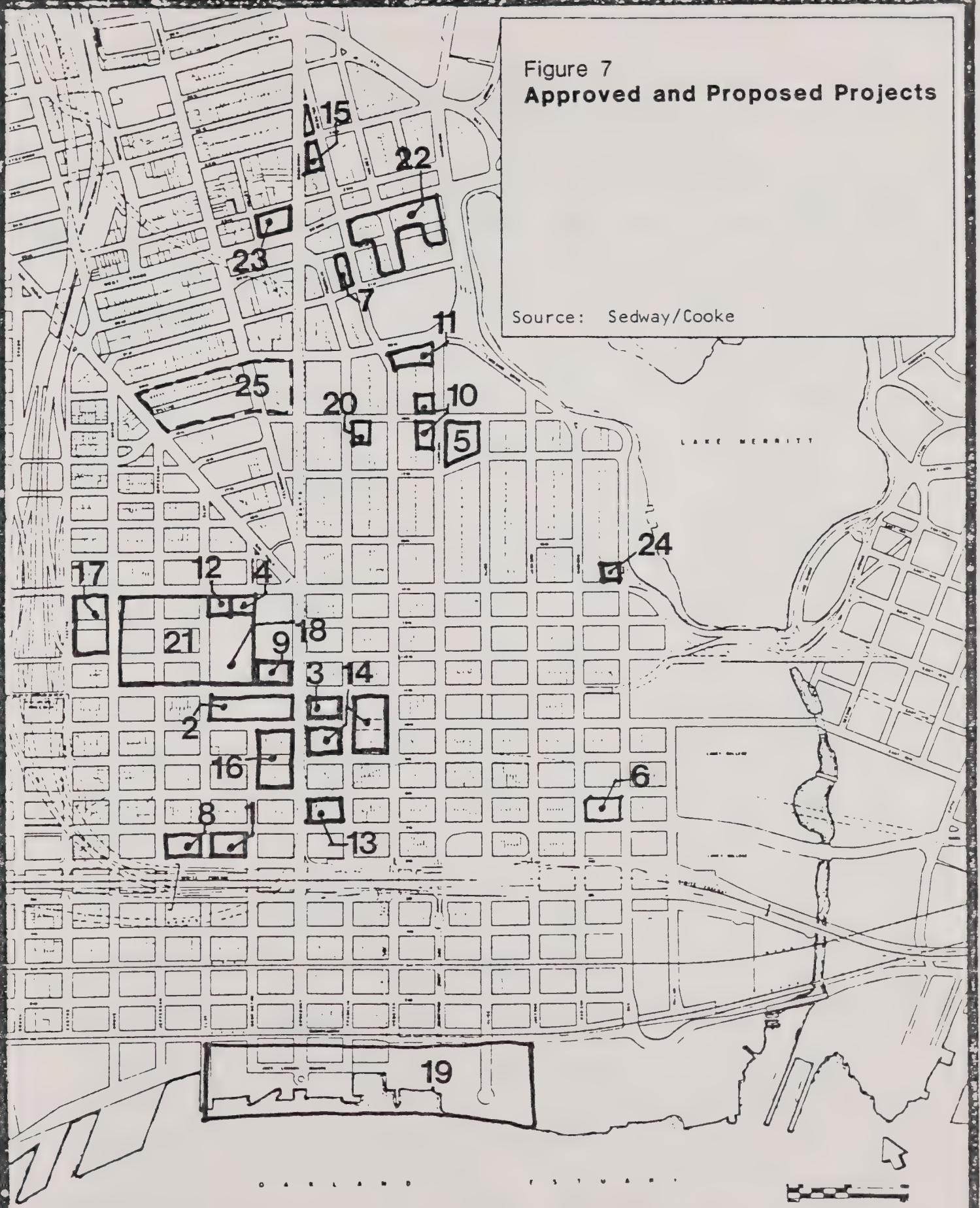
Office projects under construction, pending or proposed in the CBD would tend to reinforce the existing concentration of development in two nodes: one in the Kaiser Center vicinity and the other about the City Center site and to the east. (A third, but lesser, node in the Jack London Square area would also be created.) This has direct impacts on transit service and accessibility in the downtown. There is a notable lack of any identified growth in the Broadway corridor between the two major nodes, despite this corridor appearing to be economically under-utilized at present. This development pattern will directly impact transit service ease, accessibility and dependency in the downtown.

Individual project schedules call for the bulk of the development to be completed and occupied within the next 10 years. There is a question, however, based on review of regional office growth projections by others* (see Appendix C) as to the rate at which the proposed development will be absorbed within downtown Oakland. The 18 million gsf proposed in downtown Oakland, when combined with over 15 million gsf under construction or proposed in other areas of Alameda and Contra Costa County, exceeds the projected 1990 two-county demand by 25 million gsf. Moreover, the market support for development in the two counties depends in part on movement of jobs from downtown San Francisco. There are signs that the San Francisco market may be becoming over-built. Some 30 million gsf are under construction or proposed, or 16-17 million gsf more than the projected 1990 market for the City of San Francisco. This could lead to more competitive lease terms in San Francisco and a slower rate of relocation of jobs to other employment centers such as Oakland. Preliminary analysis based on the above growth projections suggest that up to 8 million gsf could be absorbed in downtown Oakland within the next 10 years. Under this projection, the full occupancy of the proposed 18 million gsf would occur beyond year 2000. Hence, this Phase I analysis considers two development scenarios: 8 million gsf as the low level alternative, and 18 million gsf as a high level alternative. The latter represents an accelerated rate over current market

* American City Corporation and ABAG.

Figure 7
Approved and Proposed Projects

Source: Sedway/Cooke



OAKLAND CENTRAL DISTRICT

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TABLE 4: APPROVED AND PROPOSED DEVELOPMENT
OAKLAND CENTRAL DISTRICT

<u>Project</u>	<u>Developer</u>	<u>Space (1,000 Gross Sq. Ft.)</u>				<u>Parking (Cars)</u>	<u>Hotel Rooms</u>	<u>Housing Units</u>
		<u>Date of Occupancy</u>	<u>Office</u>	<u>Retail</u>	<u>Other</u>			
1. Courts Building	Alameda County	3/82			200			
2. Hyatt Regency Hotel/Convention Center		83			120		508	
3. TransPacific Center, Phase I	Asian Holdings	6/82	232	78		(356)		
4. City Center OB III	Bramalea/ Grubb & Ellis	10/82	175					
5. Gerald Hines Building		6/83	739			(400+)		
6. Regional Admin. Center	BART/ABAG/ MTC	4/83	106					
7. 2101 Webster	Pankow Developers	9/83	440			(50)		
8. Detention Center	Alameda County	12/83			232	(638)		
9. Bechtel Phase I	Bechtel Group	1/84	600					
10. Cadillac Fairview Phase I & II	Cadillac Fairview	3/84	400 750	10		50 (200)		
11. Lake Merritt Plaza	Transpacific Development (Shurl Curci)	8/84	770 to 970	30				
12. City Center OB IV		10/84	180					
13. 7th and Broadway	Chang/ Elckman	84	100	50+		(4 levels)		(500)
14. TransPacific Centre, Ph. II	Asian Holdings	1/85	1,500	61		(2,000)		(400)*
15. First United Methodist Site	American Devel- opment Corp.	3/85	225					
16. Victorian Row		82-86	150	150				

* Excludes proposed housing outside project area.

<u>Project</u>	<u>Developer</u>	<u>Space (1,000 Gross Sq. Ft.)</u>				<u>Parking (Cars)</u>	<u>Hotel Rooms</u>	<u>Housing Units</u>
		<u>Date of Occupancy</u>	<u>Office</u>	<u>Retail</u>	<u>Other</u>			
17. Preservation Park		83-86	20					
18. Bechtel Ph. II	Bechtel Group	1/86	300					
19. Port Embarcadero Ph. I & II	Port of Oakland	84-85	800	66		(4700)	(550)	
20. Leamington Hotel		88	100					
21. City Center (Excludes OB III, IV, V)	Bramalea	84-93	4,500	150		(2700)		(350- 600)
22. Kaiser Center Expansion	Kaiser	84-90	4,500 to 5,100	360		(2200)		
23. Old Broadway Bowl/Site	Americian Recreation, Inc.	N.D. (est. 85-90)	427			(400)		
24. Lakeside Plaza	Lakeside Plaza Group	N.D. (est. 85-90)	127			(78)		
25. Capwell's Center: Dept. Store General Retail		N.D. (est. 95-2000)		400 400				
26. Miscellaneous				150				

projections or a longer-range planning horizon. Conversely, the lower rate represents a growth rate more consistent with current market projections or a shorter-range planning horizon.

There is considerable longer-range development potential beyond that proposed at present, based on considerations of land supply in the downtown. The amount of underutilized (and therefore developable) land was roughly estimated on the assumptions that (1) vacant parcels and parcels on which surface parking or buildings of less than three stories are underutilized from a market perspective, and (2) floor area ratios for new development would range between 10 and 20. Based on this, total potential development in the Central District, beyond the 18 million gsf currently proposed, could range from 33 to 53 million gsf.

The potential large supply of downtown land for development has several implications on future CBD growth and land use patterns. First, the proposed 18 million gsf does not necessarily imply ultimate conditions. It is simply an arbitrary level that conservatively only considers firm proposals to date. Second there is some uncertainty (as well as some flexibility) in the future for re-orienting land uses to optimize transit service and accessibility. Third, it raises the question of whether greater use of lands at the fringe of the CBD should be made for peripheral parking (particularly on the west side where it would intercept I-980 traffic) and/or residential uses (particularly on the east side where advantage can be taken of Lake Merritt's amenities). Both of these uses would reduce the amount of commute traffic within the central area.

2. Projected Future CBD Travel

A cordon/screenline analysis was performed to scale the possible effects of downtown growth on future travel demand to and from the downtown. The CBD cordon conforms to the Central District boundaries as described earlier and captures all travel into and out of the CBD. Two screenlines were also defined to identify internal effects: Broadway to capture east-west travel, and 14th Street to capture north-south travel. The process involved projecting total person travel attributable to future downtown development; allocation to each primary transportation mode; and superimposing of this generated travel to the appropriate cordon and/or screenline locations.

In the analysis, two future development scenarios (8 million and 18 million gsf) were tested, and both were assumed to occur over a 10 year period. Table 5 summarizes total travel generated by mode for the two development levels, based on rates used in recent EIR's of downtown projects.

An important assumption underlying the projections is that of transit mode split. A survey of Kaiser Center employees indicates that 25 percent of them currently use transit (AC or BART), while comparable surveys at Oakland City Center show that 45 percent of the employees commute by transit. The analysis here assumes a 50 percent transit mode split for employees of new development, reflecting anticipated scarcity of parking, increased gasoline prices and the like. If a lower transit mode split were to occur, parking and traffic demands would be proportionately increased, and vice-versa. As the future mode split is a key study issue and variable, it is discussed further under study issues.

Table 5
PROJECTED NEW TRIPS DUE TO FUTURE CBD DEVELOPMENT
PM Peak Hour (Two-Way)

	8 Million GSF		18 Million GSF	
	Person Trips	Auto Trips*	Person Trips	Auto Trips*
AC Transit (24%)	6,000	--	13,000	--
BART (26%)	6,000	--	15,000	--
Subtotal	12,000	--	28,000	--
Auto (45%)	11,000	9,000	25,000	21,000
Walk, bike (5%)	1,000	--	3,000	--
Total	24,000	9,000	56,000	21,000

* Assumes average car occupancy of 1.20.

3. Potential Effects on AC Transit

Results of applying these projections to existing AC Transit load factors are shown in Table 6 and Figure 8. The table shows that even at the 8 million gsf level, there could be a significant overall capacity deficiency (average load factor of 1.45) out of the downtown during the PM peak hour, necessitating additional peak period capacity on numerous CBD lines. In the absence of additional capacity being provided, substantial spreading of the peak period would have to occur to avoid excessive overcrowding. Also, extensive re-allocation among routes would be necessary. At the 18 million gsf level, the projected load factor exceeds AC Transit's service standard by 70 percent. Even if ridership were spread evenly over the whole three-hour peak period the standard would be exceeded. Assuming the current overall level of AC Transit service and a 1.25 maximum load factor, the threshold development level beyond which some spreading of the peak beyond a one-hour period would need to occur is only about 5 million gsf. The "saturation" development level (that is, the maximum development level that could be accommodated with a fully spread three-hour peak period without exceeding an average 1.25 load factor) is about 14 million gsf.

4. Potential Effects on BART

Potential effects of the two development levels (8 million and 18 million gsf) on BART load factors are shown in Table 7. Results are also summarized on Figure 8. The table assumes a 70 percent capacity increase on all lines due to the improvements noted earlier. Both development levels also assume a 50 percent increase in ridership not

Table 6
PROJECTED AC TRANSIT LOAD FACTORS*
PM Peak Hour/Peak Direction

<u>Cordon</u>	<u>Existing</u>	<u>8 Million GSF</u>	<u>18 Million GSF</u>
West	.44	.65	.97
North	.89	1.32	1.96
East	1.17	1.74	2.57
South	<u>1.23</u>	<u>1.85</u>	<u>2.75</u>
Total	.97	1.45	2.13

* Ratio of passengers to seats. AC Transit's service objective is to keep load factor under 1.25 during the peak half hour.

Table 7
PROJECTED BART LOAD FACTORS(1)
PM Peak Hour/Peak Direction

<u>Checkpoint Location</u>	<u>Route(s)</u>	<u>Existing</u>	<u>50% Background Growth Plus:</u>	
			<u>8 Million GSF</u>	<u>18 Million GSF</u>
MacArthur Station	Daly City to Concord	1.32	1.37	1.62
	Daly City to Richmond	1.13	1.15	1.34
	Fremont to Richmond	0.76	.91	1.22
Lake Merritt Station	Daly City to Fremont	1.27	1.07	1.07
	Richmond to Fremont	1.19	2.05	3.30(3)
San Francisco Civic Center Station ⁽²⁾	San Francisco to Daly City (All routes)	0.94	.86	.90

(1) Ratio of passengers to seats. BART's service objective is to keep load factor under 1.30 during the peak hour.

(2) Peak load point for westbound passengers from Oakland.

(3) Exceeds physical limit of BART cars. Does not reflect any reassignment of cars from other lines or diversion of passengers to other lines as would likely occur to reduce load factors on this line.

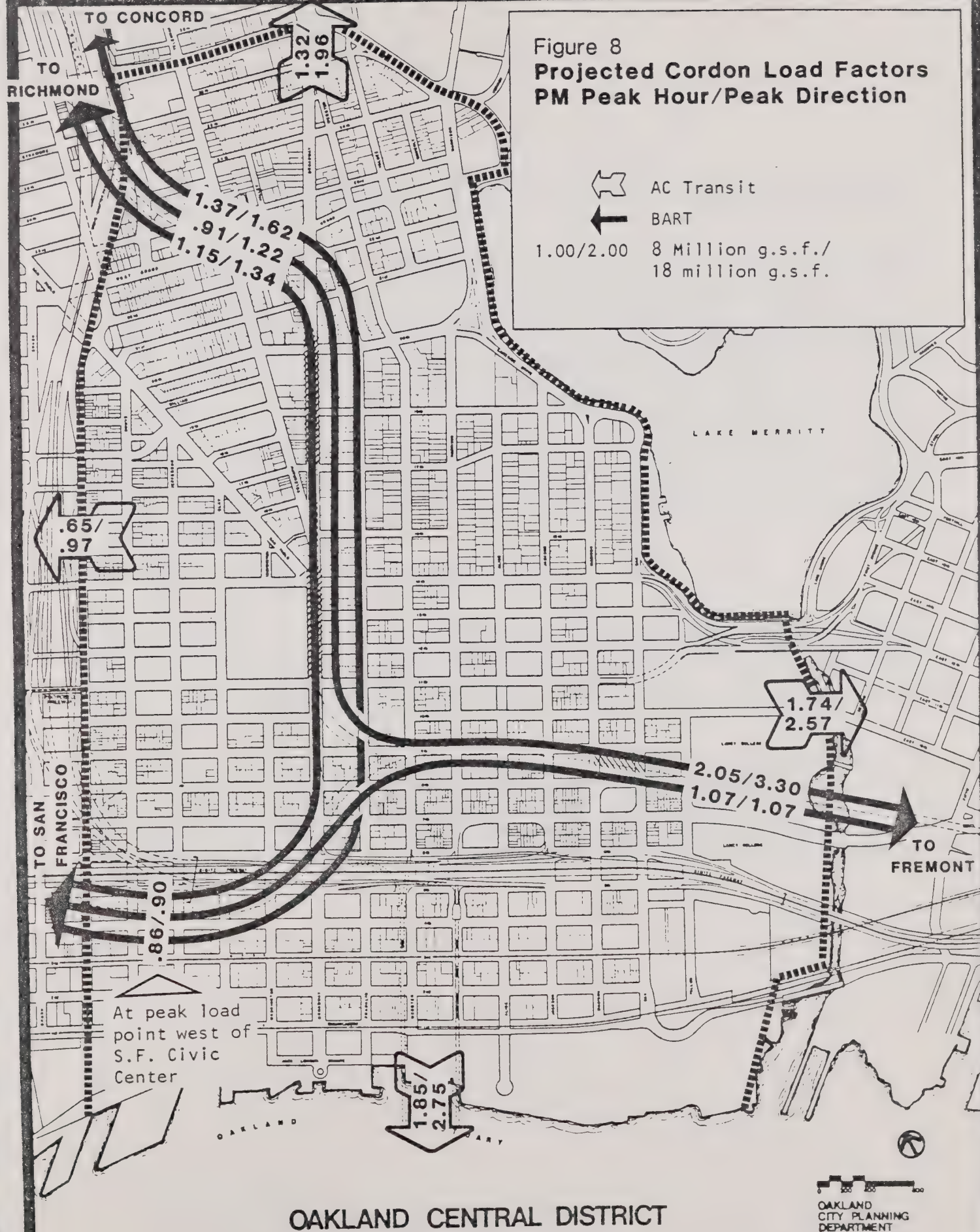


Figure 8
Projected Cordon Load Factors
PM Peak Hour/Peak Direction

-  AC Transit
-  BART
- 1.00/2.00 8 Million g.s.f./
- 18 million g.s.f.

At peak load
point west of
S.F. Civic
Center

OAKLAND CENTRAL DISTRICT

0 100 200
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related to downtown Oakland growth (4.1 percent annual growth* over ten years). These background growth projections may be on the conservative (high) side, since growth in Oakland could conceivably reduce the potential for growth elsewhere.

On the critical Daly City to Concord line, the peak hour load factor is projected to slightly increase relative to the present under the 8 million gsf development scenario. With the higher development level of 18 million gsf, the load factor could exceed 1.6 which is well beyond the 1.30 standard targeted by BART and represents severe overcrowding. Assuming the 50 percent non-Oakland growth, the threshold level (that is, the amount of Oakland CBD development possible without exceeding a 1.30 load factor on the Concord line and without spreading of the peak period beyond an hour) is estimated to be on the order of 4 million gsf, which is roughly comparable to that of AC Transit. Conversely, for the full 18 million gsf to be developed in downtown Oakland, non-Oakland growth on the Concord line would have to be less than 8 percent in order to meet the 1.30 load factor standard without any spreading of the peak period beyond one hour. The saturation development level, where the peak period would spread to three hours, is projected to be in excess of 18 million gsf over and above the 50 percent non-Oakland ridership increase.

5. Potential Traffic and Parking Effects

Potential effects on cordon and screenline traffic volume/capacity ratios due to downtown growth are shown in Figures 9 and 10. With 8 million gsf, three intersections are expected to exceed Level-of-Service (LOS) "D", all in the north. The Nimitz Freeway and Posey Tube entrance would also exceed capacity. At the 18 million gsf level, 14 intersections plus the Nimitz Freeway and Posey Tube would exceed LOS "D", with several at LOS "F."

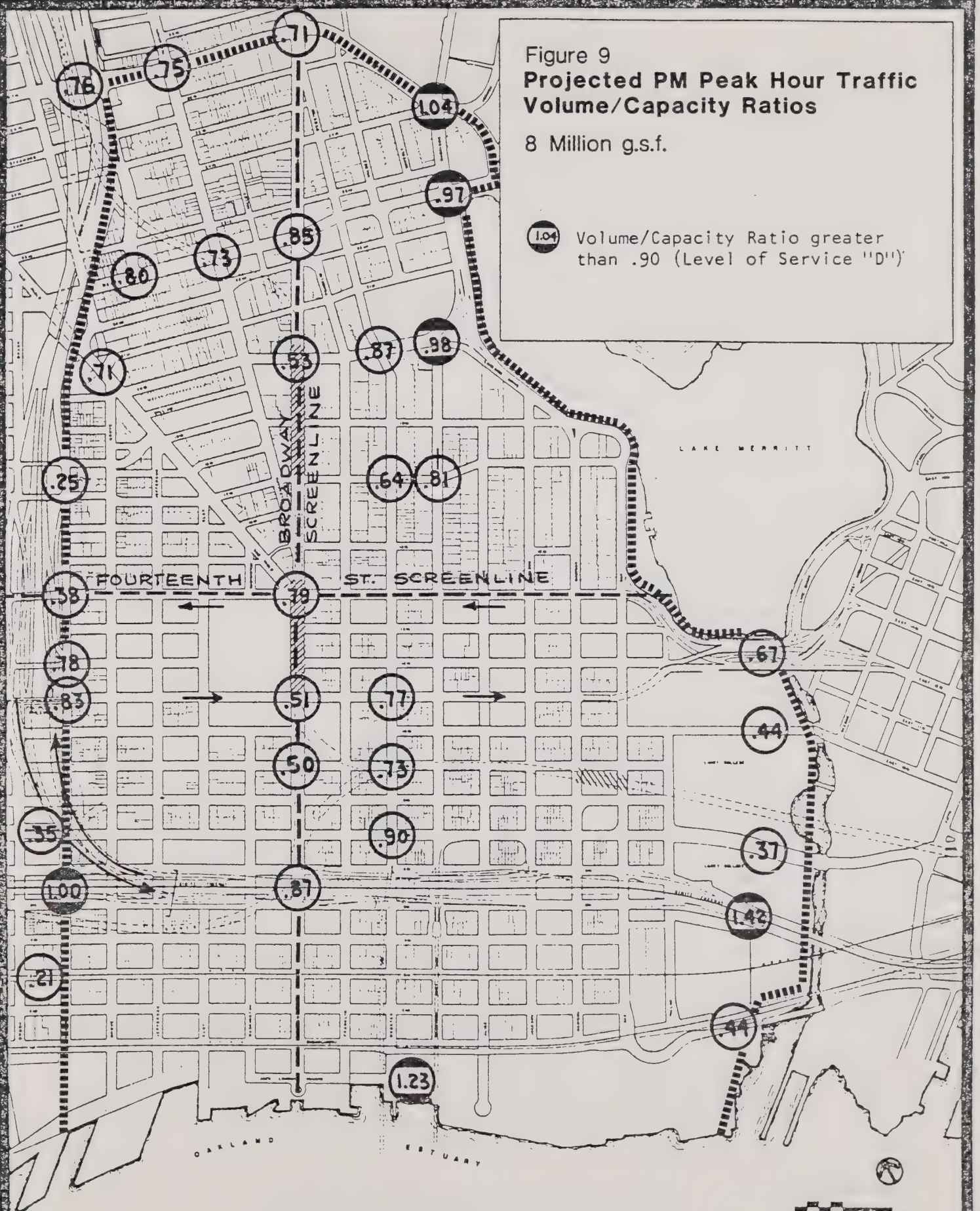
Table 8 summarizes projected parking space demand, supply and deficits for each of the two development levels. The projected deficits range from 6,000-14,000 spaces all told. These reflect net additional parking supply proposed on-site in developments, but assume no other parking increases. These estimates are very approximate due to lack of available data. However, they do indicate the general scale of the potential deficiencies involved.

* Source: BART Short Range Plan, May, 1981.

Figure 9
Projected PM Peak Hour Traffic
Volume/Capacity Ratios

8 Million g.s.f.

1.04 Volume/Capacity Ratio greater
than .90 (Level of Service "D")



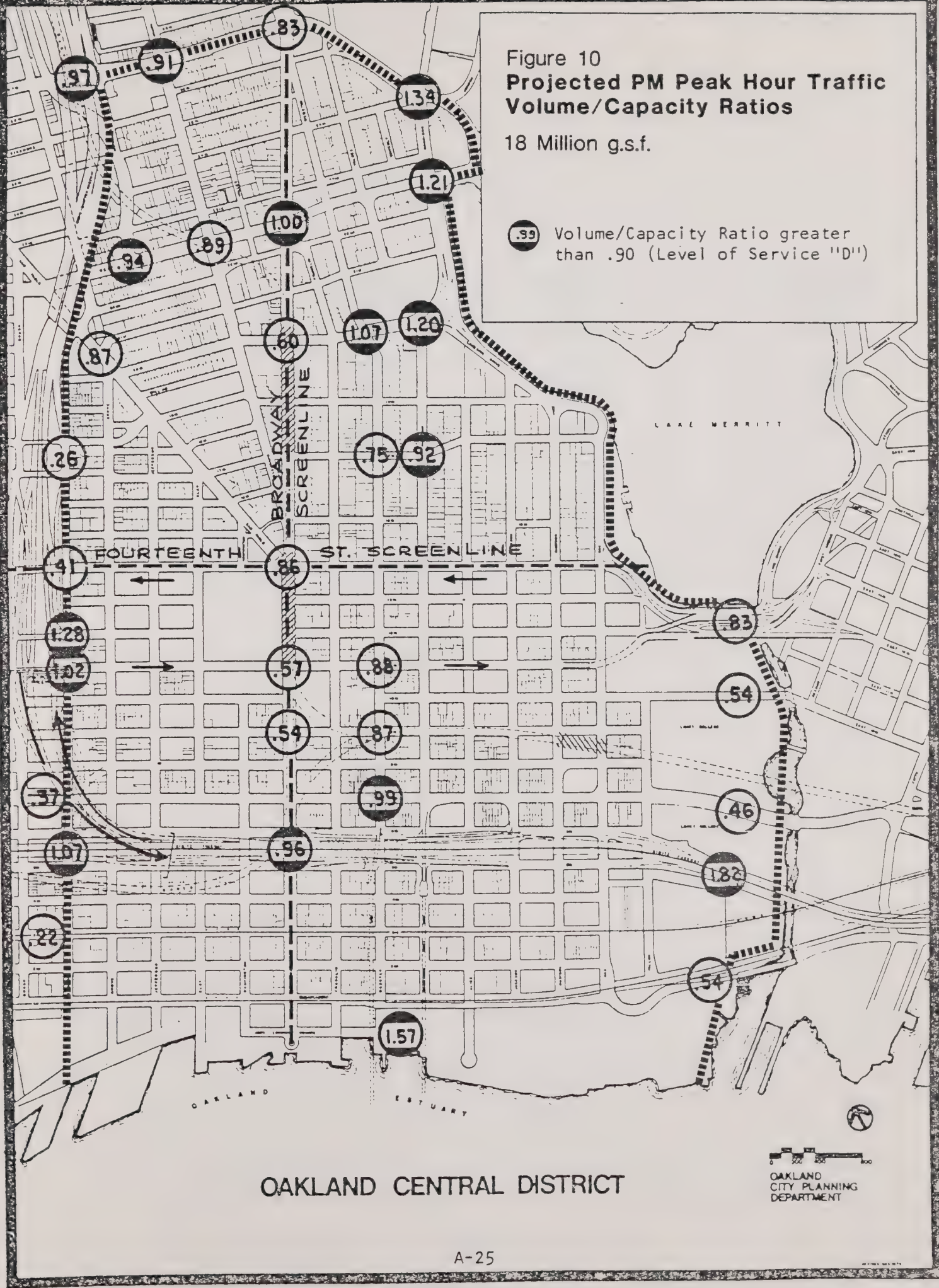
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Figure 10
**Projected PM Peak Hour Traffic
 Volume/Capacity Ratios**

18 Million g.s.f.

.99 Volume/Capacity Ratio greater
 than .90 (Level of Service "D")



OAKLAND CENTRAL DISTRICT

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Table 8
PROJECTED PARKING IMPACTS
Peak Period Spaces

	<u>Existing</u>	<u>8 Million GSF</u>	<u>18 Million GSF</u>
Demand	16,000	31,000	47,000
Supply	20,000	26,000	35,000
Capacity *	19,000	25,000	33,000
Deficit	3,000 (Surplus)	6,000	14,000

* 95 Percent of supply

Note: Figures order-of-magnitude only; see text for underlying assumptions.

APPENDIX B Transit Issues

For study purposes, five goals have been formulated that relate to downtown transit service. To accomplish each of these goals, a number of issues need to be addressed during Phase II. These transit and transit-related issues were identified primarily from meetings with various transportation agencies and providers, the City of Oakland, developers, and the study's TAC and CAC.

Goal I: Establish a Comprehensive Downtown Policy to Balance Transit Services, Other Transportation Modes and Land Use

Transit service both influences and is influenced by other components of the downtown and its transportation system. There are three major linkages: (a) the amount of transit usage in part depends on traffic/parking capacity and vice-versa; (b) transit and other modes all compete for the same limited downtown space; and (c) the amount, nature and distribution of CBD land use will directly impact the need for, and effectiveness of, transit services. The following issues speak to these relationships.

1. Appropriate Transit Mode Split Goals for the Downtown

Perhaps the very first issue to be addressed is the appropriate target for transit mode split in the CBD. This affects the amount of transit capacity needed, as well as traffic circulation and parking improvements needed to support any given level of overall development. Consistent with recent EIR's for downtown projects, the analysis in Chapter II presupposes significant shift toward transit use in the future, in part due to constraints on the traffic circulation system and projected deficiencies in parking. Current employee mode split ranges from 25-45 percent transit. Our analysis assumed 50 percent transit mode split on all new developments throughout the CBD. A substantial parking deficiency (between 6,000 and 14,000 spaces) is projected even with the increased use of transit. In the absence of development of more parking, it is conceivable that further shift toward transit could--and perhaps should--occur. However, AC Transit and BART may be very hard pressed to supply even the needed capacity implied by the assumed mode split level of 50 percent, let alone a higher one. This is particularly so in the case of the high development scenario. Conversely, if it is not possible to sufficiently expand transit service to the downtown, a still greater number of parking spaces (and associated roadway improvements) would need to be constructed. If neither transit nor parking is expanded, downtown Oakland could lose competitive edge with other employment centers, and potential for new development in the future could be constrained to well below the amount now being proposed. The most reasonable approach toward resolving this key issue is likely to be recognition that no single transportation system is going to satisfy the total new demand and to coordinate transit planning efforts with planning of downtown traffic parking improvements.

2. Development of a Comprehensive Circulation System

Although the street system in downtown Oakland is a mature one, the planned extension of I-980 to connect with the Nimitz Freeway, the lack of continuity of the existing

network, the prospects of additional street closures in the City Center, Trans Pacific and Capwell Center areas, and the potential for greatly increased through traffic accessing the Webster/Posey tubes due to development on the Alameda side will substantially alter downtown traffic patterns and volumes. There is the need, therefore, for developing a comprehensive circulation system that most effectively provides for movement of autos and transit vehicles; that establishes priority functions of each street; and that provides good access to existing and future development.

- o Street Continuity: A particular issue here is that the existing street system already lacks continuity except on a few routes, due to various physical barriers. Future developments are likely to increase the pressure for closing streets, while concurrently putting more demands on the remaining ones.
- o Freeway Access Re-orientation: Another concern is that the I-980 extension is likely to reorient much of the auto traffic into east-west corridors with freeway access, of which there are few at present, while not altering the basic circulation patterns for transit service. This may present opportunities for concentrating major traffic volumes into specific high-capacity east-west corridors, while emphasizing transit circulation, local access, and truck loading along north-south corridors.
- o Competition for Street Space: The third key issue is that growth in auto, truck, and pedestrian traffic will greatly increase the competition with transit vehicles for available street and sidewalk space. This, if not mitigated, could impede bus operations, create pedestrian congestion near bus stops and hamper other street functions such as truck loading.

The City needs to adopt a policy to define, prioritize and protect auto and transit corridors in the downtown within the context of an overall circulation and land use policy. Particular attention should be given to protecting high capacity routes with direct freeway access.

3. Downtown Parking Policies

The amount and location of parking in the downtown will directly impact the need for transit services in the future. As noted earlier, a CBD-wide deficit of 6,000 - 14,000 parking spaces could occur based on the two development levels considered. At a rough cost of \$10,000 per space (in structure) this represents a potential capital cost of \$60 to 140 million not including land costs. This is over and above the spaces being proposed on-site within the various proposed developments, which would be funded privately. Failure to fund and construct the additional spaces would put additional pressure on the transit system. Conversely, inability to fund and implement transit improvements would increase the dependency on autos, thereby further increasing the number of parking spaces needed to support the projected development levels.

Aside from the over-riding issue of how much future parking should be provided in total, several other questions should be posed:

- (a) How much parking should be provided on-site? Current zoning regulations do not require the provision of parking on-site within the central area of downtown.

However, current proposals do include some on-site parking, generally on the scale of 0.6 - 0.8 spaces per 1000 gsf of offices (net after accounting for existing spaces lost due to construction). Unfortunately, this only satisfies 1/3 to 1/2 of the projected demand, even when considering a relatively high transit mode split. This is much lower than provided in competing suburban communities such as Walnut Creek, Concord, San Ramon and Fremont, but higher than provided in San Francisco. The effects of on-site parking provisions on development cost and the potential share of the regional office and retail market captured by downtown Oakland, must be considered in reviewing the current policy for on-site parking provisions.

(b) Where should off-site parking be located? As noted elsewhere, it may be appropriate to channel future parking into areas west of Broadway so as to intercept I-980 traffic. There may be a need to consider transit service to connect these peripheral parking areas to employment centers east of Broadway.

(c) How should parking be financed, and how will this affect transit financing? Given the overall bleak picture for funding of transportation on the part of public agencies, this is a critical issue. Transit financing is discussed in a later section. In addition to competing with many of the same funding sources, as used for public transit improvements, parking improvements could potentially be financed by revenue bonds, unlike transit. Another potential source would be in-lieu fees for developers that do not or cannot provide sufficient parking on-site.

4. Transportation System Management Policies

The issue of how much transit service needs to be provided to the downtown in the future is not simply a question of transit vs. auto. Some transportation system management (TSM) policies and actions can also reduce the peak hour demand for transit without increasing auto driving and parking to the downtown. Two general kinds of actions are supportive of this objective.

(a) Ride-sharing programs: Rider-sharing encompasses transportation services that involve pre-arranged shared rides for persons with similar and regular travel patterns. Included are carpools and buspools, and they are usually directed toward the longer distance commute market. The basic objective of a ride-sharing program is to increase the number of persons carried in a given number of vehicles (i.e., average vehicle occupancy) by providing incentives such as rider-matching preferential parking, promotions and the like.

(b) Work Hours Program: The basic objective of this program is to spread the time employees arrive and leave over a longer period, thereby reducing peak capacity requirements on the transportation system. To some extent, this occurs naturally as congestion increases and employees alter their travel schedules to avoid these periods. (This is observed to have occurred on BART transbay service, for example). Work hours spreading can be facilitated and promoted by adoption of employer-based flextime or staggered work hours programs. Both BART and AC Transit have considerable reserve capacity on either side of the peak hour. (A major constraint with BART, however, is that parking lots at many feeder stations fill up very quickly in the AM period. This discourages use of the system after the

AM peak hour, thereby constraining peak period spreading in both the AM and PM.) The implications on BART and AC Transit load factors and on downtown development capacity of peak period spreading have been noted in the previous chapter.

An important aspect of both of these TSM programs is that they are relatively low in cost. Hence, if successful, they could reduce overall transportation improvement costs associated with increased development in the downtown.

5. Coordination Between Land Use Policies and Transit

The primary function of transit in the downtown is to facilitate the desired land use pattern and intensity by ensuring the needed level of access. However, transit can in turn serve as a means of attracting desired land uses and channeling these into a serviceable pattern. Conversely, if land uses are to be serviced in a manner that minimizes congestion, maintains good accessibility, promotes energy conservation and minimizes adverse air quality impacts, they must be located and developed in patterns which make transit service feasible. Given these interrelationships, the Phase II transit study should be coordinated with land use planning as part of a more comprehensive Central District Development Plan and Program.

Several questions about future land uses can be posed that directly bear on transit provisions.

(a) What degree of transit dependency should be promoted for downtown development? Current zoning regulations in the central portion of the downtown imply heavy reliance on public transit since a maximum floor area ratio is not specified nor is parking required. Is this implied policy and if so for what portions of downtown is it appropriate, and what levels of transit improvements are necessary to support the policy?

(b) What is an appropriate pattern of land uses to facilitate transit usage? There appears to be a substantial oversupply of developable commercial land in the Central District, with the potential to support perhaps 33-53 million gsf beyond the 18 million gsf now proposed. In light of this, there is considerable uncertainty in what the ultimate land use patterns of the downtown might be, as well as the opportunity to shape these patterns, through land use policies, so as to facilitate efficient and effective transit service. Should jobs be clustered to a greater extent on the downtown BART stations and/or the Broadway corridor? Should residential uses be encouraged on the east side of the Central District so as to reduce commuting into the area? Should parking be concentrated west of Broadway so as to intercept traffic from I-980 and minimize traffic crossing Broadway?

(c) What is an appropriate level of downtown growth for use in planning of transit service improvements? Two development levels have been considered in this issues paper. The lower level, 8 million gsf, is based on fairly optimistic (high) market projections by others for the next 10 year period. The higher level, 18 million gsf, accounts for all developments currently proposed in the downtown within the next 10 years. Given the large pool of remaining developable land supply in the downtown, even the 18 million is not an ultimate condition for the long-range.

Most transit planning currently focuses on a short-range horizon of 5 years. However, where BART is concerned, any improvements beyond those now underway are clearly well beyond the Five Year horizon. Moreover, a longer-range analysis must be done, at least on a conceptual level, to establish long-term policies for transit operations and service downtown. Hence, there is a key question as to what planning horizon or horizons are to be considered in Phase II, and what levels of development could occur during those periods.

Goal 2: Increase AC Transit Service Capacity For Downtown Oakland Commuters in the Future

Based on limited available data it appears that AC Transit provides adequate capacity for existing ridership into and out of the downtown at all times of the day. There may be instances where AC Transit's service objective of keeping load factors on all lines to less than 1.25* during the peak one-half hour is not met, but they are likely limited to short sections of the line and to only occasional, individual runs. Moreover, AC Transit's service objective is judged a relatively high standard for a peak 1/2 hour period.

Upon full occupancy of all known development plans or proposals (totaling some 18 million gsf) an increase of 120 percent in peak period bus riders is projected. At the lower development level (8 million gsf) a 50 percent increase is projected. These increases are due in part to the number of new downtown employees and visitors, as well as to AC Transit attracting a larger share of the commute person-travel (24 percent of all trips) due to the growing scarcity, expense, and remoteness of commuter parking. Even so, the transit ridership projection presumes development of a large amount of new parking in the downtown beyond that being proposed on-site by major developers. If the additional parking (which could number on the order of 14,000 spaces) were not provided in the future, there could be even greater demand for AC Transit services by commuters than projected.

AC Transit's current draft short-range plan does not anticipate any overall system expansion over the next five years. Moreover, there is an unfunded deficit in the projection of current level operations that may require, in addition to fare increases, service reductions downtown or elsewhere. (One route being considered for discontinuation is the Oakland Downtown Shuttle).

In the absence of any expansion of service capacity to the downtown, the projected ridership growth due to either the 8 or 18 million GSF development levels would more than use up any existing surplus in downtown transit capacity. The average peak hour load factor over all routes crossing the downtown boundaries is projected to increase from 0.97 at present to 2.13 upon full occupancy of all proposed projects (18 million GSF). This greatly exceeds AC Transit's 1.25 maximum load factor target. It also exceeds crush capacity of the existing bus service and therefore indicates major deficiency of bus capacity on downtown routes.

* Ratio of seats to passengers during the period. See Appendix A for qualitative description of load factors.

The potential ridership growth in concert with AC Transit's present inability to finance system expansion in the future brings to bear a number of crucial transit issues for downtown Oakland. These are discussed below.

Issue 1: Re-Allocation of Existing AC Transit Services

In the absence of funding for overall expansion of the AC Transit System, the issue of re-allocating available services to increase peak downtown passenger capacity must be addressed. There are a number of methods of re-allocating bus service:

- Shifting service from one CBD route to another.
- Shifting service from non-CBD routes to CBD routes.
- Shifting service from non-peak period to peak period service.
- Assignment of higher capacity vehicles to downtown service.
- Shortening of individual routes by means of transit centers (CBD end) or park-and-ride stations (outer end).

(Additionally, there is potential for shifting service from bus routes served by BART to downtown routes. This is discussed below under BART/AC service coordination).

In any re-allocation, the fundamental technical issue is that to increase service in one place, service is reduced elsewhere. To justify shifting service to specific CBD route(s), it will have to be shown that the new CBD service will be more productive than the prior service. AC Transit staff is routinely evaluating productivity measures (such as passengers per hour, subsidy per passenger and farebox ratio) of existing routes, and this will facilitate such shifts. But the Phase II analysis will have to demonstrate that any new service will be more productive than what exists. This means that reasonably accurate ridership forecasts are necessary during Phase II, and these need to be on a route-by-route basis for all downtown routes.

The issue of reducing service also has to be addressed on a policy level. AC Transit's policy is to provide certain minimum service levels and accessibility depending on the population density of the area. Service re-allocation may be in conflict with this policy in some instances. Similarly, AC Transit's objective is to achieve a certain minimum level of productivity (e.g., passengers per bus-mile) on each line. Even if it can be demonstrated that productivity would increase by re-allocating service elsewhere, it may not be acceptable to do so if the existing line is meeting current productivity standards. Moreover, service cutbacks to achieve productivity increases may conflict with other objectives, such as maintaining adequate accessibility for transit dependents.

- a. Reallocation of Service Among CBD Routes: The objective of this would be to equalize peak load factors among CBD routes by means of service headway adjustments in response to future growth patterns. This would maximize the number of passengers carried for any given fleet size assigned to the CBD. Theoretically, with re-allocation of services to achieve perfect balance in load factors while keeping total service fixed, it would be possible to

support up to an estimated 5 million square feet of new development in the downtown while still meeting the 1.25 load factor objective during the PM peak hour. Conflicting performance standards, as noted above, may limit this, however. Therefore, a key question is what happens to service on the non-CBD end of the routes affected. For development beyond the 5 million gsf, a net increase in CBD transit service and/or spreading of the peak period is necessary. With spreading of the peak period to 3 hours, 14 million gsf could be added without increasing overall transit service.

- b. Reallocation of Non-CBD Service to the CBD: To further increase CBD access capacity on AC Transit, service could be shifted from routes outside the Oakland CBD. As with re-allocation among CBD routes, the degree to which non-CBD services could be shifted would depend on the extent to which the CBD services would be more productive as well as the degree to which other performance standards are not met.
- c. Additional Peak Period Service: It may be possible to gain peak period capacity for CBD commuters by curtailing off-peak services. Generally, peak period services are more productive to provide than non-peak services. Again, there is a question as to how much of this could occur without conflicting with other minimum standards. Moreover, AC Transit is constrained under current labor agreements as to how many part-time drivers can be used on the system, and expects to use its maximum number within the next year or two. Therefore, in order to take advantage of peak period service, AC Transit may have to negotiate for relaxation of this restriction in future labor contracts.
- d. Fleet Mix: Downtown bus capacity could also be increased by using larger capacity buses such as articulated buses. AC Transit's current fleet of 30 "artics" seat 69 passengers each as opposed to 45-51 on standard buses. They are primarily used for transbay service. The key conflicts posed by this are (i) the need to purchase additional artics, (ii) the extent to which they can operate efficiently on downtown streets, and (iii) the number of lines that can accommodate artics on their residential ends.
- e. Park-and-Ride Stations: Express lines can be shortened and local service in low-density or inaccessible areas reduced by the use of park-and-ride centers on the outer ends of routes. AC Transit does not have any such centers at present for express services into downtown Oakland (although park-and-ride likely occurs informally to some extent). Formal park-and-ride centers in conjunction with increased express service may be warranted in the future as ridership levels increase.
- f. Transit Preferential Treatments: High-occupancy vehicle (HOV) lanes, traffic signal priority and other preferential treatments on access routes to the Oakland CBD could increase transit operating speeds in the future, thereby allowing more runs to be made within the peak commute periods. For example, Caltrans is currently studying high occupancy vehicle (HOV) lanes from the MacArthur Freeway at Route 24 to the Bay Bridge Toll Plaza. It may be possible to modify these to also service the Oakland CBD.

Issue 2: AC/BART Service Coordination

Another opportunity for increasing AC Transit capacity in the CBD lies in improved service coordination with BART. This is a joint responsibility of both BART and AC Transit, but since BART routes and headways are essentially fixed, AC Transit has greater control over coordination. As BART capacity is increased in the future, it may be possible and desirable for AC Transit to modify bus routes which supplement BART corridor service, either by shortening them to become BART feeder lines or by discontinuing them altogether. This would free up equipment and drivers for CBD service. This is particularly the case in lesser used BART corridors such as the Richmond-San Francisco lines.

The recent AC Transit/BART Coordination study of the Richmond Corridor is a step in this direction. These efforts should be continued and strengthened in the future as BART capacity increases and as CBD demands on AC Transit service grow.

There are conflicting issues to be addressed, however. First, there is the question of BART's peak period capacity (line and station access) within each affected corridor. Corridors will likely remain in the future that require the combined capacities of AC Transit and BART. Second is the issue of coverage. BART does not serve the MacArthur Freeway corridor well, nor portions of the Berkeley area, for example. The MacArthur Freeway HOV lanes being considered by Caltrans could increase AC Transit capacity and speeds and hence further favor AC Transit service in these corridors. The third key issue relates to financing, particularly in considering Transbay service reduction. AC Transit farebox ratios (i.e., recovery of operating costs from fares) are higher for Transbay service, even the more marginal routes, than for other services. Hence, any shifting from Transbay service to Oakland CBD service would adversely impact AC Transit revenues.

Goal 3: Optimize AC Transit Downtown Operations

The second general goal for downtown transit service relates to operating strategies for AC Transit within the downtown. Current downtown operations may not be appropriate for future development patterns or ridership levels. Indirectly, downtown operations also affect downtown access capacity, as efficient operations within the downtown area will maximize the equipment and drivers available for CBD access trips.

A number of major issues have been identified that relate to the goal of optimizing downtown bus operations, and are discussed below. The first three issues deal with general service concepts, while the remaining ones focus on specific concerns.

Issue 1: General Transit Service Concepts

Existing service concentrates most AC Transit service along Broadway and 14th Street, with a major transfer point at the Broadway/14th intersection (which is also a BART/AC transfer point). A fundamental issue--one that will affect most of the other issues about downtown operation--is whether the existing east-west and north-south transit corridors will continue to be the most effective way of serving the downtown. Factors that need to be considered are the locations of employment centers; street continuity, width and

operating speeds; traffic and pedestrian conflicts; and the like. Alternatives to consider include maintaining existing corridors (and possibly upgrading them to better serve transit); shifting to parallel routes that better serve future land use patterns; dispersal of downtown routes to provide a downtown grid system; re-orienting most service into one direction only (e.g., along Broadway) with peripheral transfer points; establishing a downtown transit terminal (similar to existing Transbay Terminal in San Francisco); and operating a downtown loop (either as part of the trunk routes or using a separate circulator system) with transfers at CBD cordon points. Some of the possible transit service concepts are shown in Figure 11.

Issue 2: Downtown Transit Terminal vs. Through-Routing

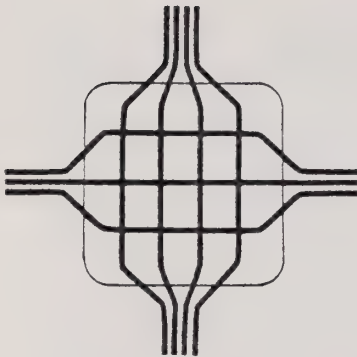
AC Transit's current route pattern favors through-routing of lines within the downtown. (Two major exceptions are that five lines terminate at Kaiser Center and six lines terminate in Jack London Square, at opposite ends of the CBD.) This has both advantages and disadvantages. On the positive side, it minimizes the need for transfers among non-CBD travellers, and also provides a distribution system from one end of the CBD to the other. It also avoids the need for bus layover in the downtown. On the other hand, it potentially results in unbalanced load factors since service headways must be the same on both ends of the line even though passenger volumes may differ. It also makes bus operations more inflexible and bus routes longer. The concept of operating a downtown transit terminal has been suggested in the past. Whether this is preferable over through-routing depends largely on distribution needs, overall route structure downtown, and ridership patterns. To address this issue, it would be necessary to quantify existing downtown through-travel; identify candidate sites; evaluate impacts on bus operations and costs; and on walking distances to downtown destinations.

Issue 3: Transit Priority Streets

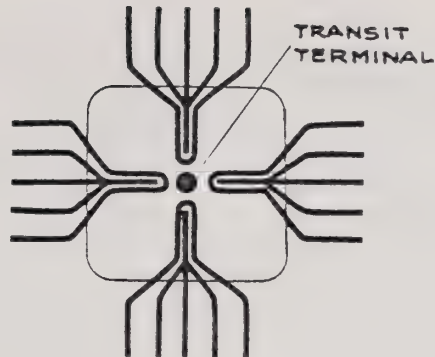
With increased auto and truck volumes competing for limited downtown street space, it may be desirable to provide preferential treatments for buses on some downtown streets. These could include exclusive bus lanes (either with-flow or contra-flow); bus malls where all auto traffic except cross-traffic is banned; or new rights-of-way for exclusive use by transit. (The latter treatment is probably not appropriate in downtown Oakland as no right-of-way opportunities exist). A major potential conflict posed by transit preferential treatment is impacts on other street functions (auto circulation, truck loading, parking, driveway access). Hence, this issue equally impacts AC Transit and the City of Oakland. To address this issue, candidate streets have to be identified (in conjunction with evaluation of alternative downtown route structures); specific treatments developed; impacts on bus operations evaluated; and impacts on auto circulation, capacity, truck loading, parking, etc., assessed.

Exclusive curb bus lanes have been proposed in the past* for Broadway between 6th/7th and 20th Streets. Broadway more than meets generally accepted minimum bus volumes

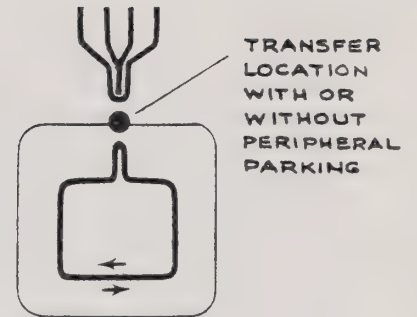
* Oakland Downtown Shuttle Study, DKS Associates and J. Warren & Associates, 1980.



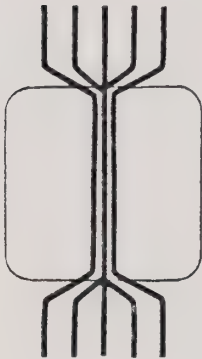
GRID SYSTEM



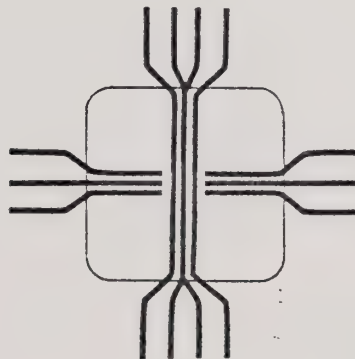
RADIAL SYSTEM
WITH DOWNTOWN
TRANSIT TERMINAL



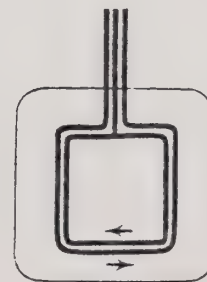
PERIPHERAL
TRANSFER
POINTS



CORRIDOR THROUGH
SERVICE



TWO-CORRIDOR
SYSTEM



DOWNTOWN
LOOP

Figure 11
Examples of Downtown Route Concepts

for exclusive curbside bus lanes (30 buses per hour). The street is wide enough to accommodate bus lanes while still maintaining at least one lane each way for mixed traffic. Other candidate streets for transit priority treatments include 14th Street, the Webster/Franklin couplet and Telegraph Avenue. Fourteenth Street carries up to 50 buses per hour and could potentially serve other lines now using 12th and 13th Streets. Use of 14th Street for transit lanes would conflict, however, with the City's proposal to develop it as a major east-west traffic route. Use of Webster Street with a northbound contra-flow lane north of 20th Street would improve transit access to Kaiser Center. To the south, transit priority treatment may be warranted at the entrance to the Webster Tube to Alameda since this is a major potential bottleneck location in the future. Telegraph Avenue could be an alternative to developing Broadway as a transit mall, particularly in light of tentative proposals for expanding commercial uses in the vicinity of Capwells. Other downtown streets may also be candidates for transit priority treatment in the future if AC Transit routes are relocated.

Issue 4: Broadway Mall

Broadway has historically been, and continues to be, the major downtown spine for transit services. Historically, Broadway has also been the major traffic corridor through downtown. That function is diminishing, however, as the planned completion of the I-980 freeway corridor is anticipated to re-orient major traffic flows into east-west corridors. In the future, it appears that the major share of employment and commercial activity will continue to be within walking distance (a few blocks) of Broadway. Therefore, it may be appropriate to consider formalizing the use of Broadway as primarily a transit corridor by developing transit preferential treatments such as:

- o Transit Mall -- which would prohibit autos and other vehicles from using Broadway, at least during day time hours. (Cross-traffic would be permitted, however).
- o Semi-transit Mall -- which would limit northbound Broadway to buses only but be used by all traffic in the southbound direction.
- o Exclusive Bus Lanes -- which would designate curb lanes in both directions for buses only. Center lanes would be open to all traffic.
- o Relocation of some bus lines to other streets -- candidate streets are Franklin Street, Webster Street and Telegraph Avenue (15th to 20th Streets). Most other north-south streets either are not continuous through the downtown or are not centrally located.

A basic question that needs to be addressed is what effect this would have on auto circulation and volumes on parallel routes. Unlike transit malls that have been constructed in other cities, Broadway does not have continuous parallel routes on both sides to which to divert auto traffic. Other key questions are effects on truck loading and local auto access to businesses along Broadway; impacts on cross-traffic; benefits to transit operations and service; and financing of capital improvements.

Issue 5: 14th/Broadway Transfers

Existing AC Transit bus routes in downtown Oakland are heavily concentrated along Broadway and to a lesser extent 14th Street. Consequently, the 14th/Broadway area is a major inter-line transfer point. All AC Transit lines serving downtown except six northbound lines that use Franklin Street converge in this area. The City Center BART Station reinforces this as a transfer location. There is a major conflict posed by this situation. On the one hand, AC Transit depends heavily on the presence of convenient transfer locations to maximize overall accessibility and continuity of the system, and the 14th/Broadway location is ideally suited to this given AC's route structure. On the other hand, the presence of large numbers of non-CBD persons congregating in sidewalk and plaza areas at building entrances has been cited as a major security problem by affected businesses and merchants and the police. It is largely a social issue that is difficult for AC Transit to deal with. The City Center project will generate still more pedestrian and bus passenger traffic in the area and make the problem all the more visible. There are several ways to deal with this. One is to de-emphasize the transfer location by shifting some bus routes to other streets. This has been done in the recent past when a few bus lines were moved from 14th Street to 13th Street. Another way is to reroute lines to create a major transfer location elsewhere (such as by moving Broadway lines to Franklin and Webster and developing a major transit terminal in that corridor). And, finally, it would be possible to build upon the existing transfer location, providing facilities to better serve transferring as well as boarding passengers, while also enhancing the area for others. The latter method is compatible with development of a transit mall along Broadway.

Issue 6: Feeder Service to BART Stations

There are three downtown BART stations: 12th Street, 19th Street and Lake Merritt. Two other stations are just outside the CBD: Oakland West and MacArthur. Most AC Transit routes (27 in all) are oriented toward feeding the 12th Street station. As noted previously, this contributes to a perceived problem of too many people without CBD destinations being congregated at the 14th/Broadway intersection. The 19th Street station connects with 21 bus lines (all of which also serve the 12th Street station). Only four lines serve the Lake Merritt station, not counting the ODS. Since no parking is provided at the 12th and 19th Street Stations, and only 250 spaces at the Lake Merritt Station, they rely heavily on access by foot and by transit.

There is a major issue of whether existing AC Transit feeder service will best serve future land use patterns and needs in the CBD, and what effects BART/AC service coordination would have on feeder service at downtown locations. BART has raised the question of whether AC Transit feeder service should be more oriented toward the MacArthur and West Oakland Stations which are more appropriate as major transfer locations. This is particularly so in the case of any AC Transit Transbay service from the Nimitz or MacArthur corridors being re-oriented into BART feeder lines. The MacArthur Station is the only high capacity transfer Station in the BART system. Oakland West has the advantage of intercepting all San Francisco runs. Any increased use of the 12th Street Station would compound problems at the 14th/Broadway intersection. The 19th Street and Lake Merritt Stations are not appropriate as major transfer stations. To address this issue, it may be necessary to look beyond the present Central District Study boundary, including coordination with the ongoing Oakland Transportation Terminal

Project that is evaluating feasibility of an inter-modal transit facility at the Oakland West BART Station. A key work item to be done in future work is to assess the nature and amount of transferring that is now occurring between AC Transit and BART (vs. AC to AC).

Issue 7: Oakland Downtown Shuttle (ODS)

The issue of whether to continue operation of the ODS, and if so, how to improve its performance has been raised by both AC Transit and downtown business interests. AC Transit is considering whether to discontinue the service as a way to reduce AC's projected unfunded deficit for the next year. The ODS, while meeting the first year ridership goal, has not improved since then, and falls well behind other routes in terms of productivity and farebox ratio. AC Transit is concerned that downtown businesses are no longer actively promoting the service. Some merchants feel that AC Transit has not done enough to advertise it. The Chamber of Commerce has recently requested BART to advertise the service on the BART system. Still others question whether the route would be better patronized if extended or modified. Possible extensions include to Embarcadero Cove on the south end; northerly extension to the Grand/Lake area; service to Pill Hill; and extended evening hours to better serve Jack London Square businesses. BART has endorsed the ODS as a potentially effective feeder service to downtown BART stations; as all three stations are on its route. ODS service frequencies are reduced during commute periods due to capacity limitations, however; therefore its usefulness as a feeder service is limited at present. Another apparent problem is that proposed CBD developments that would be likely to generate ridership growth on the ODS (e.g., City Center, Kaiser, Jack London Square) will not be completed for several years. Concern has been expressed that, once discontinued, it may be difficult to reactivate the ODS once the developments have been completed.

To address this issue, it will be necessary to evaluate various possible service changes; evaluate cost implications as well as benefits to the downtown and to AC Transit; and identify supplement funding sources for the future.

Issue 8: Service to Jack London Square

Presently, about six local bus lines plus the ODS terminate in Jack London Square. Plans for major expansion, including offices, hotel and commercial, have been announced. When complete, these could greatly increase the need for transit service over today. However, the Jack London Square area is physically separated from the Central CBD, and also spread lineally over a mile, and these factors pose special problems for improving transit access. Moreover, the preliminary development plans do not incorporate specific provisions for transit service.

Basically, there are two ways to serve the area. One is to extend a number of CBD routes to the foot of Broadway, with a terminus and layover within or near the Square, such as is done at present. This is compatible with the concept of Broadway being a major transit corridor for main lines. It would minimize, but not avoid, the need for most Jack London Square riders to transfer to BART or other AC Transit lines. And it would not provide east/west service distribution between Embarcadero Cove and Cost Plus. Furthermore, buses destined for the Square would continue to be impeded by trains on the Southern Pacific and Western Pacific tracks unless the route terminus were

relocated north of the tracks. (Train crossings are not viewed by AC Transit as a significant problem at current operating levels, however.) The second way to serve the Square is to terminate the main lines in the central area of the CBD and instead operate a feeder line from this point to the Square (such as the ODS). This would force all riders from Jack London Square to transfer, but would improve transfer opportunities and may simplify AC Transit operations and improve productivity.

Issue 9: Access to Pill Hill

The Pill Hill area is not within the present study area boundaries. However, lack of good access from Pill Hill to the CBD has been cited as a problem, as there are three major hospitals in the general area. AC Transit has considered extending one or more routes now terminating at Kaiser Center up to Pill Hill. Access could also be improved by extending the ODS route north or operating a separate shuttle in conjunction with or in addition to the existing MacArthur BART Station shuttle. The questions posed by this issue are what amount of new ridership could be generated, what would be the most cost-effective way of serving the demand, and who would pay for any added cost of operation.

Goal 4: Increase BART Capacity for Downtown Oakland Commuters in the Future

BART provides sufficient overall capacity to and from downtown Oakland at present. However, the Daly City-Concord and Daly City-Fremont lines have high load factors. Ridership growth, both region-wide and in downtown Oakland, is projected to outstrip BART capacity, even with the planned 70 percent increase in capacity. This will result in excessively high load factors on some lines. PM peak period riders attempting to board at downtown Oakland stations will be particularly affected as outbound seats and standing room will be already occupied by San Francisco commuters.

Four issues have been identified that have bearing on attainment of this goal, and are discussed below.

I. To What Extent Can BART System Capacity Be Increased for Oakland Commuters?

The planned 70 percent capacity increase does not necessarily represent ultimate BART system capacity. BART is now undertaking a System Performance Study to determine how to optimize the capacity and performance of the existing system. The study is scheduled to be conducted over the next two years. The study does not look at passenger demands or origin - destination patterns. It focuses only on technical aspects of running more trains past a given point on the system. There is an opportunity--and a need--to coordinate the BART study with Phase II of the Central District study to ensure that the scope of the BART study addresses the downtown Oakland capacity problem, and in turn that the Central District study reflects realistic opportunities and constraints for BART service in the CBD.

One major issue that is apparent relates to use of the third track (KE) now under construction. At least initially, it is intended for side-tracking disabled trains so as to minimize service disruptions in the critical Oakland Wye. It may be possible in the future, however, to utilize the third track for revenue service so as to enable BART to

run trains between Oakland and Concord without transbay service. This would require constructing a fourth track through downtown Oakland for reverse direction dead-heading; running the trains all the way to the Hayward yard; or extending the third track further west for temporary storage of trains near Oakland West station. Constructing the fourth track would be extremely costly, would disrupt service on other lines, and would pose physical problems in attempting to match the fourth track to the lower level platform height. The Oakland West extension may be possible by extending the third track above grade, and adding storage tracks near the Station. The idea would be to run selected trains inbound to Oakland in the AM peak, store them on this extended track during the day and run them outbound to Concord in the PM peak. This would give commuters boarding in downtown Oakland a fair chance at seats or standing room. BART estimates that up to a 30 percent capacity increase could be achieved on this line out of downtown Oakland by using the third track for peak direction revenue service.

2. Downtown Oakland BART Station Access

BART has recently adopted station improvement plans for all stations, including the three downtown Oakland stations. Adopted recommendations for the three downtown Oakland stations are as follows:

- 19th Street: - Improve passenger information
- 12th Street: - Develop pedestrian/open space linkage to City Center
- Develop underground pedestrian walkway to the Trans Pacific Centre
- Continue Oakland Downtown Shuttle
- Improve patron information signs
- Lake Merritt - Develop 100-space preferential carpool parking area
- Develop 435 space parking structure to serve as interceptor parking for northbound Route 17 and Alameda traffic.

Generally speaking, they are minor improvements and do not necessarily reflect the potentially high levels of development which may occur in the Central District. The two exceptions to this are pedestrian/open space linkage from the 12th Street station to the City Center (already done) and an underground pedestrian walkway from the station to the Trans Pacific Centre. This latter recommendation is no longer being seriously considered by the City. A third major proposal for the 12th Street Station is a continuation of the ODS by AC Transit. As noted earlier, AC Transit is considering discontinuing this route due to financial problems. The present route and schedule are not oriented toward peak period feeder service. A restructuring to provide better feeder service might result in more patronage and remove the threat to discontinue the shuttle. Station access plans should be reviewed and revised to better reflect the current development prospects.

Additionally, the issue of pedestrian linkage to downtown BART stations will need to be further addressed in Phase II. This could include consideration of minor sidewalk and street crossing improvements, as well as special pedestrianways to major development sites such as Kaiser Center and Capwell Center.

3. Background BART Growth

Future, passenger load factors at downtown Oakland BART stations are highly dependent on the rate of growth of non-Oakland traffic.

For purposes of scaling transit needs herein, a 4.1 percent annual growth rate in peak period BART ridership has been assumed for non-Oakland growth on all lines. This is based on trend analysis done by BART.* Oakland ridership growth was superimposed onto this since the trend analysis did not reflect rapid growth in the Oakland CBD. An issue that needs to be addressed in Phase II is whether the background growth rates on some or all BART lines should be reduced, since to some degree any growth taken up by Oakland will reduce growth potential elsewhere.

4. BART Capital Improvements Beyond 1987

BART capital improvement funding is committed through 1987 to the various projects described in the previous chapter. Beyond 1987, BART should address the issue of whether BART should fund extensions to the system or instead focus on increasing line capacity of the existing system such as with a Third Track extension or Fourth Track at the Oakland Wye and further access improvements at existing feeder stations. The ongoing System Performance Study may aid in dealing with this issue.

Goal 5: Seek Financing for Downtown Transit and Transit Related Improvements

Substantial additional capital and operating funds are potentially needed for transit, traffic and parking improvements to service either of the projected CBD development levels. These costs would be borne primarily by the City of Oakland, AC Transit and BART. The comprehensive downtown plan -- of which transit is a key element -- must reflect realistic financing potentials and limitations for each affected agency. In light of the gloomy financial outlook for public funds at present, a thorough investigation of all possible funding sources, including the private sector, is critical to the overall Phase II study. A preliminary list and discussion of possible funding sources are given in Appendix D. Pending legislation (e.g., SB1331 and SB1335) might also affect transit funding in the future.

A general assessment of Central District transit financing issues and opportunities follows below:

1. Public Transit Agency Funding

AC Transit and BART are funded from Federal, State and local sources. The forthcoming five-year period appears to be financially uncertain for AC Transit and BART. Both agencies may face substantial unfunded deficits in the future due in part to cutbacks in Federal and State funds and effects of Proposition 13 in limiting property tax revenues.

* Source: 1981 BART District Short Range Transit Plan, Final Draft, p. 43.

To avoid an unfunded operating deficit in FY 1982-83, AC Transit has proposed a 15 percent fare increase. Service reductions are also possible, including discontinuation of the Oakland Downtown Shuttle. BART currently has an operating surplus and is also expected to raise fares for consistency with AC Transit and Muni. However, some BART Capital improvements are unfunded. BART is reportedly seeking approvals to sell revenue bonds to finance purchase of new cars. Without the new cars, the projected capacity increase to 1987 will not be achieved in full.

Both AC Transit and BART are eligible recipients for Federal (UMTA Section 3 and 5) grants. In the past, the Federal policy was to provide both capital and operating funds. The Reagan Administration has reduced overall funding and enacted a policy change to phase out operating assistance by 1985. Future Federal capital funding will be contingent on the improvement of the existing transit system's route efficiency and economic condition. The top priority in capital funding is to make the most of the system's existing service, not the expansion of transit. The Federal share cost may be increased from 80 percent to 90 percent of the total project cost but the total dollars allocated will not be increased. Therefore, the number of projects funded will be decreased and the competition of the funds more intense.

Some of the Central District transit improvements for transit may be good candidates for Federal funding if they can be shown to increase AC Transit's or BART's route efficiency and economic condition.

State funding sources can be used for capital and operating costs. These include Transportation Development Act (SB 325), local 1/2 cent sales tax apportionments (AB 1107), AB 1879 public transportation funding, transit guideway program (Article 19) and "surplus" TDA revenues from gasoline and fuel (SB 620). Eligible uses and funding levels of most of these programs are limited. The future of SB 620 is uncertain as the State Legislature is deciding whether these funds would be better spent on meeting the State's budget deficit.

The new development in the Central District would generate some additional property tax revenue to AC Transit and BART. However, it is not possible to estimate the amount at this time. In any case, it is highly unlikely that in the short term either agency will be able to fund major capital improvements or service expansion in the Central District from this source. Even with periodic fare increases, the transit operators may be hard pressed to continue present service levels let alone expand operations.

2. City of Oakland Funding

Like AC Transit and BART, the City of Oakland is facing funding cutbacks that will greatly limit its ability to fund any transit improvements in the downtown out of general revenues. The City will also have to address the competing issue of funding additional Central District parking in the future. The City of Oakland would financially benefit from the new Central District development due to an increased property tax base as well as increased sales tax returns, hotel taxes and residential spending within the City. Much of the Central District is designated as redevelopment area. Therefore, it may be possible to use tax increment financing for improving transit service on the grounds that the service improvements are needed to ensure the overall success of the planned development. Parking structures do meet the criteria for tax increment financing. A

legal opinion should be sought to verify that tax increment financing can also be used for public transit. A bonding firm should be retained to determine the amount of revenues that could be generated. An order-of-magnitude estimate, assuming an assessed value of \$100 per square foot and tax rate of 1 percent, is that 18 million gsf of new development would generate \$18 million of property tax revenues per year. However, it is not known how much of this would be eligible for tax increment financing since only the net difference between new revenue generated and the amount needed for paying off existing bond indebtedness would be available, and not all of this would likely to be reserved for transit purposes.

Revenue bonds are not a potential transit funding source (except as noted for BART vehicle purchases) but they are often used for construction of parking facilities. This could help free up other funding sources for transit improvements. It is highly unlikely, however, that the new parking facilities could generate sufficient revenues to meet their repayment schedule obligation. Assuming a construction cost of \$10,000 per space, it would cost some \$140 million to construct the entire 14,000 parking spaces projected to be needed with the higher development level of 18 million gsf. (This excludes any land costs.) The annual debt including principal and interest would be over \$6 million. At current monthly parking costs in downtown Oakland (about \$40), annual revenues would be only \$480 per space, of which about \$240 per space would be needed for operating and maintenance costs. Therefore, assuming all spaces were monthly rentals at current rates, the maximum revenues generated would be \$3.4 million or only half of the annual debt service.

3. Alternative Funding Sources

Most alternative funding sources are from the private sector, and involve either taxes or fees of some kind. Four alternative sources which could be considered for Central District transit funding are as follows:

- o Parking Fees: All or part of the parking fees collected in the downtown area from the existing and/or future parking spaces could be allocated to transit service expansion. For example, a \$5.00 monthly fee on 14,000 new spaces throughout the Central District would generate \$0.8 million annually.
- o Payroll Taxes: Subject to a 2/3 voters' approval, a payroll tax could be applied on all non-resident employees in the downtown area to offset transit costs that otherwise would be borne by residents. The percentage of new employees that would be non-residents is unknown. Assuming 72,000 new employees of which 50-70 percent are non-residents with an annual salary of \$17,000, a 1.1 percent payroll tax would generate \$6.7 - 9.4 million annually.
- o Development Fee: San Francisco's Board of Supervisors recently approved a Transit Improvement Development Fee of \$5.00 per square foot of new development. The fee is being contested in court, however. If applied to all proposed development (18 million gsf) in Oakland's Central District, a \$5.00 development fee would generate some \$90 million. This would be a one-time fee.
- o Assessment District: San Francisco's Board of Supervisors also recently approved a Transit Special Benefit Assessment District fee to be charged to downtown

businesses. The fee is based on the premise that they receive more Muni transit service than other parts of the City and should therefore pay the extra cost. Like the development fee, it is being contested in court. As an alternative to this, the City is considering increased business taxes (also in litigation). If applied in Oakland on all existing and proposed development (estimated 24 million gsf) at a rate of 30¢ per square foot (the approximate fee being considered in San Francisco), the fee would generate \$7.2 million annually. This may be difficult to impose in Oakland, however, because much of the Central District is a redevelopment area and the City Council would have to approve the creation of the new district.

A main question here is whether the private sector in Oakland would support such fees earmarked toward transit service expansion in the Central District. Another consideration is that any alternative funding source that the City chooses must meet all required approvals. The City has been challenged in court because of increased fees and taxes (Business License Fees and the Police and Fireman Retirement Tax) enacted by the City Council without two-thirds voters' approval. Another important consideration is timing. Much of the proposed 18 million gsf of development is coming up for plan approvals in the near future, and it may be too late to establish the necessary funding ordinances. This would reduce the number of available options.

APPENDIX C. Land Use/Development Potential

MEMORANDUM

DATE: March 29, 1982

TO: DKS

FROM: Sedway/Cooke

RE: Development Potential in the Oakland Central District

This memorandum summarizes our analysis of the potential for development in the Oakland Central District. First, development projects currently approved or proposed are identified and employment to be generated by them is estimated. Second, the total potential for development is estimated based on the supply of underutilized land and its zoning. Third, the market demand for major office space in the Central District over the next 18 years (through 2000) is estimated within the context of the four-county region of which it is a part (i.e. Alameda, Contra Costa, San Francisco and San Mateo). Fourth, the implications of these analyses for the absorption rate of office development in the Central District is evaluated.

APPROVED AND PROPOSED DEVELOPMENT PROJECTS

Table 1 identifies development proposals in various stages of planning within the Central District. The project name, developer, planned date of occupancy and floor area in gross square feet is listed for each project. Projects are organized chronologically according to the planned date of occupancy. The location of the projects is shown on the map in Figure 1; numbers on the map correspond to the numbers in Table 1. A total of 17,941,000 gross square feet of major office space, 1,905,000 gross square feet of retail space, 1,058 hotel rooms, and 1,250 to 1,500 housing units, are proposed or have been approved; developers anticipate completion of construction of all projects by 1995.

Table 2 provides an estimate of employment that will be generated by this development in 5-year increments. A range of employment reflecting a range of ratios of space added per employee is given. An assumption of 300 gross square feet of office space per employee results in a low estimate of 58,700 office employees added from 1982 through 1995; an assumption of 200 gross square feet per employee results in a high of 88,100. The midrange assumption of 250 gross square feet per employee results in 73,400 office employees. Total employees added from 1982 through 1995 would range from 66,150 to 96,050.

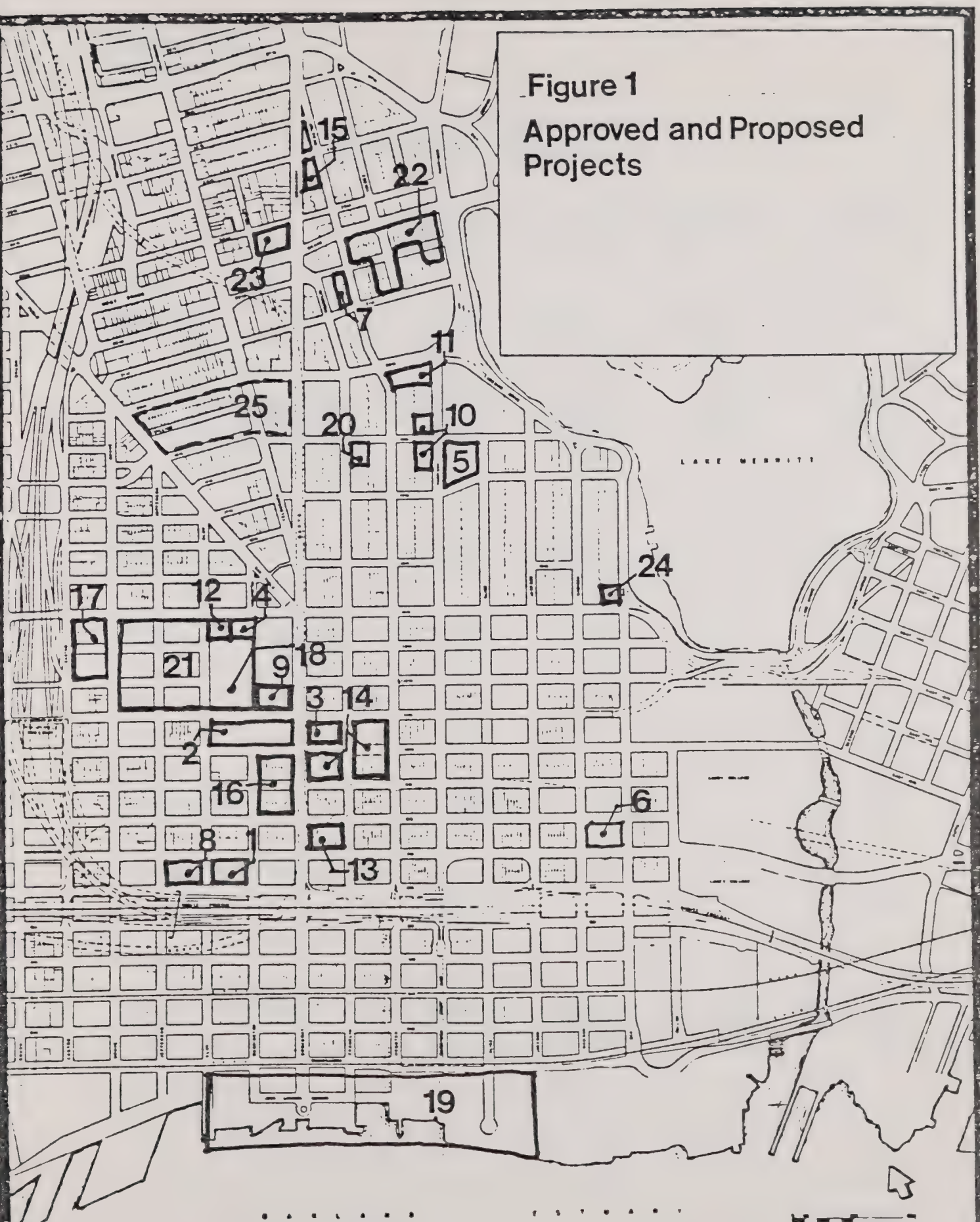
<u>Project</u>	<u>Developer</u>	<u>Space (1,000 Gross Sq. Ft.)</u>				<u>Parking (Cars)</u>	<u>Hotel Rooms</u>	<u>Housin Units</u>
		<u>Date of Occupancy</u>	<u>Office</u>	<u>Retail</u>	<u>Other</u>			
17. Preservation Park		83-86	20					
18. Bechtel Ph. II	Bechtel Group	1/86	300					
19. Port Embarcadero Ph. I & II	Port of Oakland	84-85	800	66		(4700)	(550)	
20. Leamington Hotel		88	100					
21. City Center (Excludes OB III, IV, V)	Bramalea	84-93	4,500	150		(2700)		(350- 600)
22. Kaiser Center Expansion	Kaiser	84-90	4,500 to 5,100	360		(2200)		
23. Old Broadway Bow/Site	Americian Recreation, Inc.	N.D. (est. 85-90)	427			(400)		
24. Lakeside Plaza	Lakeside Plaza Group	N.D. (est. 85-90)	127			(78)		
25. Capwell's Center: Dept. Store General Retail		N.D. (est. 95-2000)		400 400				
26. Miscellaneous				150				

TABLE 1: APPROVED AND PROPOSED DEVELOPMENT
OAKLAND CENTRAL DISTRICT

<u>Project</u>	<u>Developer</u>	<u>Space (1,000 Gross Sq. Ft.)</u>				<u>Parking (Cars)</u>	<u>Hotel Rooms</u>	<u>Housing Units</u>
		<u>Date of Occupancy</u>	<u>Office</u>	<u>Retail</u>	<u>Other</u>			
1. Courts Building	Alameda County	3/82			200			
2. Hyatt Regency Hotel/Convention Center		83			120		508	
3. TransPacific Center, Phase I	Asian Holdings	6/82	232	78		(356)		
4. City Center OB III	Bramalea/ Grubb & Ellis	10/82	175					
5. Gerald Hines Building		6/83	739			(400+)		
6. Regional Admin. Center	BART/ABAG/ MTC	4/83	106					
7. 2101 Webster	Pankow Developers	9/83	440			(50)		
8. Detention Center	Alameda County	12/83			232	(638)		
9. Bechtel Phase I	Bechtel Group	1/84	600					
10. Cadillac Fairview Phase I & II	Cadillac Fairview	3/84	400 750	10		50 (200)		
11. Lake Merritt Plaza	Transpacific Development (Shurl Curci)	8/84	770 to 970	30				
12. City Center OB IV		10/84	180					
13. 7th and Broadway	Chang/ Elckman	84	100	50+		(4 levels)		(500)
14. TransPacific Centre, Ph. II	Asian Holdings	1/85	1,500	61		(2,000)		(400)
15. First United Methodist Site	American Devel- opment Corp.	3/85	225					
16. Victorian Row		82-86	150	150				

* Excludes proposed housing outside project area.

Figure 1
Approved and Proposed
Projects



OAKLAND CENTRAL DISTRICT
CITY PLANNING COMMISSION OAKLAND, CALIFORNIA

TABLE 2: EMPLOYMENT GENERATED
BY PROPOSED DEVELOPMENT

	Time Period			
	<u>1982-1985</u>	<u>1986-1990</u>	<u>1991-1995</u>	<u>1982-1995</u>
OFFICE				
Floor Area (Gross Sq. Ft.)	7,390,000	5,450,000	5,100,000	17,940,000
Employees				
at 200 sq. ft./employee	36,950	27,250	25,500	89,700
at 250 sq. ft./employee	29,560	21,800	20,400	71,760
at 300 sq. ft./employee	24,630	18,170	17,000	59,800
RETAIL				
Floor Area (Gross Sq. Ft.)	445,000	300,000	1,160,000	1,905,000
Employees				
at 350 sq. ft./employee	1,270	857	3,310	5,437
HOTEL				
Rooms	1,058			1,058
Employees				
at .82/room	867			867
CONVENTION CENTER				
Floor Area	120,000			120,000
Employees	41			41
TOTAL EMPLOYEES	26,810- 39,130	19,030- 28,110	20,310- 28,810	66,150- 96,050

DEVELOPMENT POTENTIAL

Table 3 summarizes our findings regarding the amount of potentially developable land in the Central District, in addition to sites already approved or proposed, and the floor area that could be constructed on it. The area evaluated, as depicted in Figure 2, includes: the area bounded by Grove Street on the west, 24th Street on the north, Alice Street on the east and the Nimitz Freeway on the south; the Port Embarcadero area bounded by Jefferson Street, Oak Street and the Oakland Inner Harbor; and the blocks connecting these two areas between Washington Street and Franklin Street.

An approximation of the amount of underutilized (and therefore developable) land was made, assuming that vacant panels and parcels on which surface parking or buildings of less than 3 stories are located are underutilized from a market perspective. Based on the Floor Area Ratio (FAR) permitted under current zoning, the total floor area that could potentially be built was estimated. The C-55 zone which comprises the bulk of the Central District does not establish a limit on FAR or height. Recent projects approved in this zone have FARs ranging from less than 10 to over 20. Table 3 provides a range of floor area estimates for parcels in this zone based on FAR 10 and FAR 20. Total potential development in the Central Area in addition to the proposed and approved projects listed above, then, could range from 33 to 53 million gross square feet.

MARKET DEMAND FOR MAJOR OFFICE SPACE

The demand for major office space in the Oakland Central District was estimated using: the methodology employed by the American City Corporation as a basis for its development program for Jack London Square; ABAG's revised employment projections for the nine-county Bay Area region (2/82); and an allocation of that employment among counties and cities from an earlier ABAG estimate (Projections '79 (1/80)) that used 1975 as a base year, modified slightly to reflect trends during the years 1975 to 1980.

The American City Corporation's methodology 1) projects employment for the period of 1980 through 1985 for a region consisting of Alameda, Contra Costa, San Francisco and San Mateo Counties; 2) estimates the share of that employment captured by Alameda and Contra Costa Counties combined; 3) identifies the floor area of major office space added for every net wage and salaried employee added in the two-county area; 4) using these values, estimates the demand for major office space in the two-county area; 5) identifies the share of that office space to be captured by the downtown area; and 6) using that level of capture, estimates the demand for major office space for the period of 1981 through 1985.

American City Corporation assumes: an employment projection equivalent to an annual growth rate of 2.4% for the four-county area; an allocation of 55% of that employment to Alameda/Contra Costa Counties; a ratio of 52 rentable square feet of major office space per net employee added in the two-county area; and a

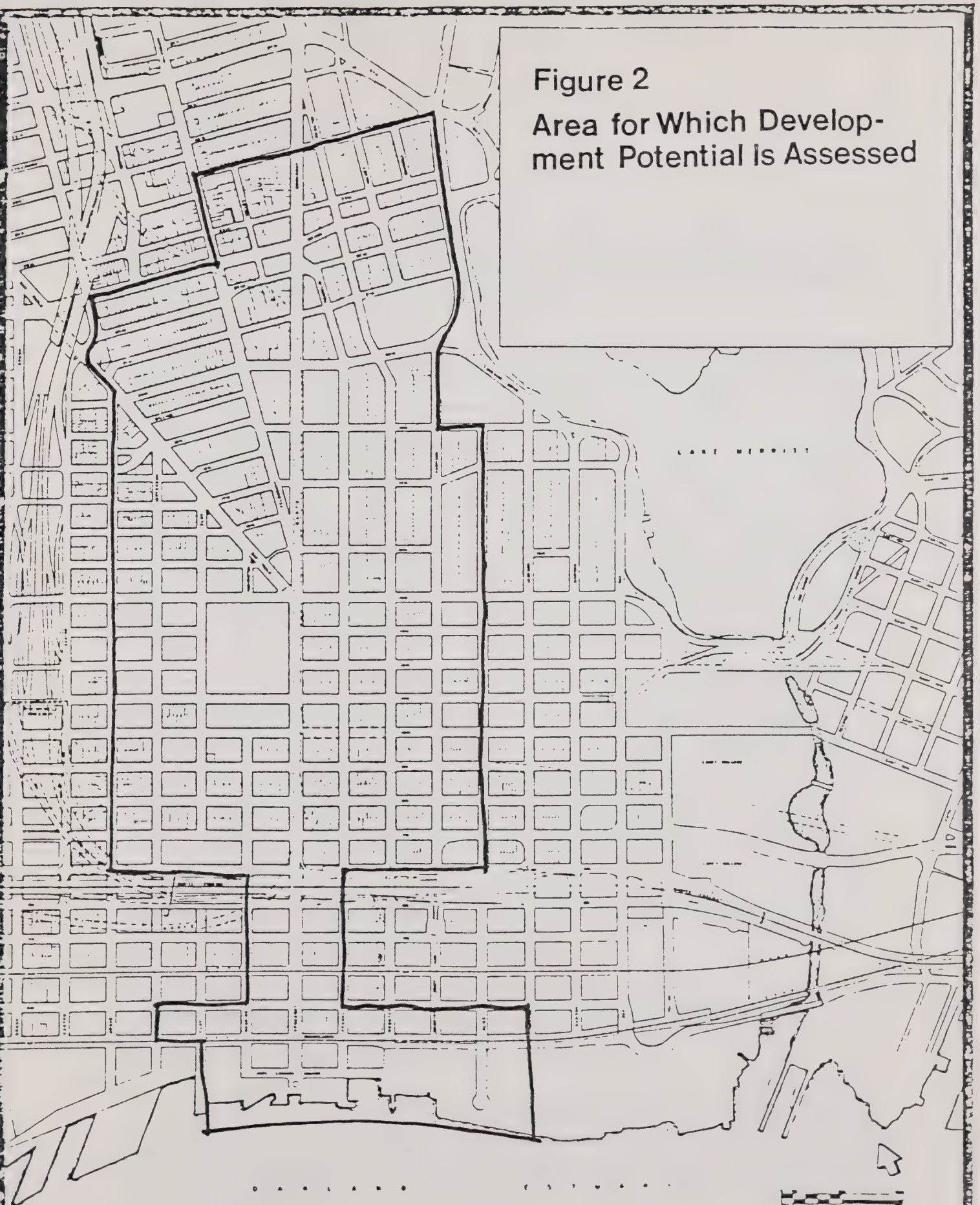
TABLE 3: OAKLAND CENTRAL DISTRICT LAND SUPPLY
 AND DEVELOPMENT POTENTIAL

	AREA (In Thousand Square Feet)		
	<u>Parcel Area</u>	<u>Permissible FAR</u>	<u>Gross Floor Area</u>
Stable Uses	3,400		
(o buildings of 3 or more stories	(36%)		
o parking structures)			
Approved or Proposed Development	1,800		
	(19%)		
Underutilized Parcels			
(o buildings of less than 3 stories,			
o surface parking &			
o vacant parcels) by district:			
C-55	1,975	20 ¹	39,500
		(10)	(19,750)
C-52	210	7.0	1,470
C-51	1,445	7.0	10,115
C-45	420	4.0	1,680
C-40	170	3.0	510
Total Underutilized	4,220		53,275
	(45%)		(33,525)
Total Central Area	9,420		

¹The C-55 district has no FAR limit; FAR 20 reflects the intensity of recently approved projects; FAR 10 is given to provide a range of values.

Figure 2

Area for Which Development Potential Is Assessed



OAKLAND CENTRAL DISTRICT

CITY PLANNING COMMISSION

OAKLAND, CALIFORNIA

downtown capture of 39% of that two-county office space. These assumptions result in an allocation of 38% of the major office space added in four-county region to Alameda/Contra Costa Counties and 6.8% to downtown Oakland or 2,100,000 rentable square feet from 1980 to 1985.

The ratio of 52 rentable square feet of major office space to each net employee added is derived from a comparison of floor area added in a portion of the area to the employees added in the entire area. Specifically, the floor area in Livermore and Pleasanton in Alameda County and all of northern and western Contra Costa County is excluded. This results in a low estimate of office space added per employee added for the two-county area. Table A-4 in Appendix A compares this ratio with others in which the geographic area for office space added and employment added correspond. Because the ratio of 52 rentable square feet per employee added is low, a slightly higher value of 60 rentable square feet (74 gross square feet) per employee added is used in our analysis. American City Corporation assumes a gradual increase in office space added per employee added as the service sector grows more rapidly than the manufacturing sector. Our projections assume a continuing increase in office space per employee as that trend continues. We also convert rentable floor area to gross floor area using a conversion factor of 1.25 (i.e. rentable floor area equals .80 gross floor area).

The methodology used to project market demand for office space for 2000 is summarized in Tables 4 and 5. Table 4 shows the distribution of ABAG's regional employment projections among counties and assumptions used. Table 5A summarizes the steps used to determine the Central Area's capture of Alameda/Contra Costa Counties' share. The major differences between these projections and the American City Corporation's is that 1) floor area is expressed in gross square footage rather than rentable square footage, and 2) the Central District's capture is expressed as a range of 20-40% of the two-county area's office demand. The low end of the range reflects the capture over the last two decades (i.e. 40% from 1960 to 1969, 15% from 1970 to 1979, and 26% for the two-decade period, suggesting a declining capture for downtown Oakland). The high end of the range corresponds with the American City Corporation's assumed capture. Tables A-1, A-2, A-3 and A-4 in Appendix A document historic activity that supports the assumptions used in Table 5.

For comparison, Table 5B estimates the office space using an alternate methodology, i.e., assuming that downtown Oakland simply captures a range of the four-county area's office space reflecting, at one extreme, its historic capture (documented in Table A-2) and, at the other extreme, double that share.

Using the first method (i.e. distribution based on employment trends) the demand for major office space downtown is expected to range from 1.3 to 2.6 million gross square feet from 1981 to 1985, 1.7 to 3.4 million gross square feet from 1986 to 1990, 2.3 to 4.5 million gross square feet from 1991 to 1995; and 2.9 to 5.8 million gross square feet from 1996 to 2000. For the 20 year period the demand ranges from 8.2 to 16.4 million gross square feet or from 10% to 20% of the demand in the four-county area.

TABLE 4: DISTRIBUTION OF PROJECTED NEW EMPLOYMENT:
Regional growth based on ABAG's revised regional projections¹ and distribution among subareas
based on ABAG's Projections '79 modified by 1975-1980 actual distribution among counties.

Area and Total 1975 Employment	<u>1976-1980</u>		<u>1981-1985</u>		<u>1986-1990</u>		<u>1991-1995</u>		<u>1996-2000</u>		<u>1976-2000 (1981-2000)</u>	
Alameda County 434,332 ⁴	59,068 ²	(32.4%)	54,736	(34%)	61,177	(34%)	70,387	(35%)	75,943	(33%)	321,311 (262,243)	34% (34%)
Contra Costa County 160,046 ⁴	37,854 ²	(20.7%)	32,198	(20%)	43,184	(24%)	54,299	(27%)	71,341	(31%)	238,876 (201,022)	25% (26%)
San Francisco County 495,480 ⁴	56,820 ²	(31.1%)	49,906	(31%)	50,381	(28%)	50,277	(25%)	55,231	(24%)	262,615 (205,795)	27% (27%)
San Mateo County 225,153 ⁴	28,947 ²	(15.8%)	24,148	(15%)	25,191	(14%)	26,144	(13%)	27,616	(12%)	132,046 (103,099)	14% (13%)
4-County Total 1,315,011 ⁴	182,689 ²	(100%)	160,988	(100%)	179,933	(100%)	201,107	(100%)	230,131	(100%)	954,848 (772,159)	100% (100%)
			60% of 9 counties ⁴		60% of 9 counties ⁴		60% of 9 counties ⁴		60% of 9 counties ⁴		60% of 9 counties ⁴	
9-County Total 2,040,006 ⁴	240,063 ³		268,313		299,888		335,178		383,552		1,526,994 (1,286,931)	

¹A total of 1,526,994 net new employees from 1976-2000 regionwide which is equivalent to an average annual growth rate of 2.25%.

²Actual (Source: Employment Development Department, Annual Planning Information, 1981).

³Projected assuming that the ABAG 25-year projections is added at a constant rate of 2.25% per year.

⁴ABAG, Projections '79.

TABLE 5: SUMMARY OF ESTIMATED OFFICE SPACE DEMAND, OAKLAND CENTRAL DISTRICT

A. Distribution Based on Employment Trends

	Time Period			
	1981-85	1986-90	1991-95	1996-2000
Employees added in Alameda/ Contra Costa Counties (from Table 4)	86,934 ¹	104,361	124,686	147,284
Square feet of major office space per employee added in the 2 counties: rentable (gross) (see Table A-4)	60 (74)	66 (82)	72 (91)	79 (99)
Demand for major office space in the 2 counties in gross square feet (Cumulative demand)	6,433,100	8,557,600	11,346,400	14,581,100
Downtown capture of the 2-county total office space demand (Table A-1)	20-40%	20-40%	20-40%	20-40%
Demand for major office space downtown in gross square feet (Cumulative demand)	1,286,600- 2,573,200 ²	1,711,500- 3,423,000 (2,998,100- 5,996,200)	2,269,300- 4,538,600 (5,267,400- 10,534,800)	2,916,200- 5,832,400 (8,183,600- 16,367,200)

¹The American City Corporation assumes 103,000.

²The American City Corporation estimates 1,200,000 rentable square feet or 1,500,000 gross square feet.

B. Distribution Based on Trends in Office Space Added

	Time Period			
	1981-85	1986-90	1991-95	1996-2000
Employees added in 4 counties (from Table 4)	160,988	179,933	201,107	203,131
Square feet of major office space per employee added in 4-county area: rentable (gross)	75 (94)	82 (102)	89 (111)	95 (118)
Demand for major office space in 4-county area in gross square feet (Cumulative demand)	15,132,900	18,353,200 (33,486,000)	22,322,900 (55,808,900)	23,969,500 (79,778,400)
Downtown's capture of 4-county area's office space	10-20%	10-20%	10-20%	10-20%
Demand for major office space downtown in gross square feet (Cumulative demand)	1,513,300- 3,026,574	1,835,300- 3,670,600 (3,348,600- 6,697,200)	2,232,200- 4,469,400 (5,580,900- 11,161,800)	2,397,000- 4,794,000 (7,977,800- 15,955,600)

PROPOSED DEVELOPMENT COMPARED WITH MARKET DEMAND AND IMPLICATIONS FOR THE ABSORPTION RATE

Table 6 lists the floor area of major office space under construction or proposed within the four-county area. This information was provided by local planning departments or surveys by real estate economists. The time frame for construction in most cases is about 10 years while the time frame for downtown Oakland is 15 years. This listing is not complete; the planning departments in some areas have no record. While the list is not comprehensive it gives a partial picture of development plans for downtown Oakland in a regional context. Proposed development for the four-county region is equivalent to 134% of the market demand for that area for the period of 1981 through 1995 and 94% of the demand from 1981 through 2000. Since the time frame for most of this construction is 10 years, it appears that, if construction proceeds as planned, there will be a surplus of office space in the mid-to-late 1980's and early 1990's.

Proposed development in downtown Oakland represents 32% of the 15-year demand and 23% of the 20-year demand for the four-county area. If downtown Oakland can capture only 10% to 20% of that demand as the market analysis suggests, proposed development represents an over-building of office-space: from 1.6 to 3.3 times the 15-year demand and equal to or double the 20-year demand. It can be expected, then, that all of the office space proposed for downtown Oakland will not be constructed or at least will not be occupied within the anticipated 15-year period. Rather, a range of from 5.3 million to 10.6 million square feet by 1995 and for 8.2 million to 16.4 million square feet by 2000 provides a more reasonable projection.

PS:jem

TABLE 6: MAJOR OFFICE SPACE UNDER CONSTRUCTION
AND PROPOSED IN 4-COUNTY REGION

	FLOOR AREA (1000 GSF)			Total as % of 4-County Region	
	<u>Under Con- struction</u>	<u>Pro- posed</u>	<u>Total</u>	<u>15-yr demand</u>	<u>20-yr demand</u>
ALAMEDA COUNTY:					
Downtown Oakland (15-year period)			17,940	32.1%	22.5%
Rest of Oakland			1,270		
Emeryville	270	750	1,020		
Alameda			NA		
Berkeley			NA		
Richmond			NA		
Dublin			NA		
Livermore	21	125	146		
Pleasanton	942	5,560	6,502		
Fremont, Hayward, San Leandro			NA		
Total County	1,233	25,646	26,879	48.2%	33.7%
CONTRA COSTA COUNTY:					
Walnut Creek	539	2,500-	3,039-		
		3,000	3,539		
Concord	73	2,729	2,802		
Pleasant Hill	226	663	889		
Pleasant Hill BART Station	0	1,411-	1,411-		
		2,822	2,822		
San Ramon/Danville	396	2,231	2,627		
Lamorinda			NA		
Total County	1,233	9,534- 11,445	10,767- 12,678	19.8%- 22.7%	13.9%- 15.9%
SAN MATEO COUNTY					
	3,000	4,000	7,000	12.5%	8.8%
SAN FRANCISCO COUNTY					
	8,634	21,266	29,900	53.6%	37.5%
4-COUNTY TOTAL					
	15,333	60,444- 62,355	72,746- 74,657	130.3%- 133.8%	91.2%- 93.6%

NA = Not Available

TABLE A-1: HISTORIC DISTRIBUTION OF ADDED EMPLOYMENT
WITHIN 4-COUNTY AREA: Column (Vertical) as % of Row (Horizontal)

	CITY			ALAMEDA CO.			ALAMEDA/ CONTRA COSTA			4-COUNTY AREA		
	Total	Service	Retail	Total	Service	Retail	Total	Service	Retail	Total	Service	Retail
<u>ABAG/EDD (1975-1980)¹</u>												
Oakland							NA	NA	NA	NA	NA	NA
Alameda County							44.3			32.4		
Alameda/Contra Costa										52.8		
<u>U.S. Census (1958-1977)</u>												
City of Oakland												
1958-67				-	31.9	-	-	27.6	-	-	16.3	-
1968-77				-	40.8	-	-	21.9	-	-	8.0	-
1958-77				-	36.5	-	-	24.0	-	-	10.2	-
Alameda County												
1958-67							67.4	86.7	45.5	36.7	32.8	26.7
1968-77							57.1	53.8	41.1	30.5	19.7	27.4
1958-77							66.7	65.8	42.7	33.2	24.4	27.1
Alameda/Contra Costa												
1958-67										54.4	52.7	58.6
1968-77										53.4	47.6	66.6
1958-77										53.8	49.7	63.5

¹ Actual Change 1975-1980: Alameda County +59,068 San Francisco County +56,820
 Contra Costa County +37,854 San Mateo County +28,947

U.S. Census of Retail Trade, Selected Services and Manufacturers, 1958, 1967, and 1977.

TABLE A-2: NEW MAJOR OFFICE SPACE, 1960-1979:
Rentable Square Feet (Percent of 4-County Area)

	<u>Pre 1960</u> <u>(or date unknown)</u>	<u>1960-69</u>	<u>1970-79</u>	<u>Total</u>	<u>ABAG Source</u>
Downtown	2,895,000 (17.6)	988,000 (8.7)	1,411,000 (6.1)	5,294,000 (10.3)	Cushman & Wakefield, Oakland Chamber of Commerce
City of Oakland	2,955,000 (18.0)	1,368,000 (12.0)	2,202,000 (9.5)	6,525,000 (12.7)	Cushman & Wakefield, Oakland Chamber of Commerce
Alameda County (excludes Livermore/ Pleasanton)	3,395,000 (20.7)	1,804,000 (15.9)	4,067,000 (17.6)	9,266,000 (18.1)	Cushman & Wakefield, Coldwell, Banker & Oakland Chamber of Commerce
Contra Costa County ¹	137,000 (0.8)	470,000 (4.1)	2,706,000 (11.7)	3,313,000 (6.5)	McMasters & Westland, Coldwell & Banker
San Francisco County (buildings 10 stories or more)	12,904,800 (78.5)	8,022,880 (70.6)	12,451,200 (53.7)	33,584,800 (65.6)	San Francisco Planning Dept.
San Mateo County ² (major multi- tenant office projects of 20,000 sq. ft. or more)	0	1,065,000 (9.4)	3,950,000 (17.0)	5,015,000 (9.8)	Cushman & Wakefield
4-County Area	16,436,000 (100)	11,362,000 (100)	23,174,000 (100)	51,179,000 (100)	

¹ Includes Concord, Pleasant Hill, Walnut Creek and Ygnacio Valley, Lamorinda, Danville, Alamo, San Ramon.

² Includes Daly City, Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, Foster City, San Mateo, Belmont, San Carlos, Redwood City, Menlo Park.

Source: ABAG, Bay Area Office Growth, April 1981.

TABLE A-3: HISTORIC DISTRIBUTION OF NEW
MAJOR OFFICE SPACE IN 4-COUNTY AREA,
1960-1979: Total of 34,743,000 Rentable Square Feet
Column (Vertical) as Percent of Row (Horizontal)

	<u>City</u>	<u>Alameda County¹</u>	<u>Alameda¹/ Contra Costa²</u>	<u>4-County Area</u>
Downtown				
1960-69	72.2	54.8	43.4	8.7
1970-79	64.1	34.7	20.8	6.1
1960-79	67.2	40.9	26.5	6.9
City of Oakland				
1960-69		75.8	60.2	12.0
1970-79		54.1	32.5	9.5
1960-79		60.8	39.5	10.3
Alameda County				
1960-69			79.3	15.9
1970-79			60.0	17.6
1960-79			64.9	16.9
Alameda/Contra Costa				
60-69				20.0
70-79				29.2
(60-79)				26.0

¹Excludes Livermore/Pleasanton.

²Excludes western and northeastern county.

Source: ABAG, Bay Area Office Growth, April 1981.

TABLE A-4: MAJOR OFFICE SPACE PER WAGE AND SALARIED EMPLOYEE

	4-County Area	Rentable Square Feet (Gross Square Feet)				
		Alameda Contra Costa Counties	Ala- meda County	Central Contra Costa County	City of Oak- land	Down- town Oak- land
Office Space Added 1970-1979 American City Corporation ⁴	68 ¹	44 ²				
Total Office Stock ⁵	46	23	20	35	33	
Office Space Added 1975-1979 ⁵	78	67 ³	30	86	53	
Oakland Central District Plan Survey, 1959 (Total Office Stock)						60

¹Office space added for portion of each county/employees added in each entire county.

²Office space for Livermore and Pleasanton in Alameda County and North and Northwest Contra Costa County is excluded.

³Both office space and employees added exclude Livermore/Pleasanton in Alameda County and North and Northwest Contra Costa County.

⁴American City Corporation, Development Program for Jack London Square, No Date (1982).

⁵EOD, Annual Planning Information, 1981-82 for 1980 employment; ABAG, Bay Area Office Growth, April 1981, for new office space; ABAG Projections '79 for 1975 employment.

APPENDIX D. Transportation Funding Sources

Prepared by Theresa Hughes & Associates

A. Federal

Urban Mass Transportation Act - Section 3

UMTA Section 3 provides funding to finance 1) the acquisition, construction, reconstruction and improvement of facilities and equipment for use in mass transportation service in urban areas and in coordinating such service with highway and other transportation, and 2) the acquisition of real property and interests in real property for use as rights of way, station sites and related purposes, including the net cost of property management and relocation.

FY 1982-1983's funding allocations are undetermined at this time. The allocations go before the Senate and House on April 23 and April 28, 1982. The final funding allocations should be known by October 1, 1982. These allocations will set policy for the next four to five years. There are no expected increases in funding. At best, funding will remain constant.

The procedures for applying for these funds may change in FY 1982-1983. In the past this funding was a discretionary capital grant program allocated on a project-by-project basis. Section 3 funds for capital grants were awarded solely at the discretion of the Secretary of Transportation.

The proposed changes will alter this funding source from discretionary to a block grant approach and will give the funds to the states to allocate. The major policy for transit funding in the future will be to improve the existing system's route efficiency and economic condition. The top priority is to make the most of the existing system and not the expansion of transit.

Federal funding comprises 80% and the local matching funds are 20%.

Urban Mass Transportation Act - Section 5

UMTA Section 5 provides funding in four categories: 1) basic, 2) second tier, 3) bus capital and, 4) rail.

- o Basic - funds are an extension of existing Section 5 capital or operating assistance distributed by the 1970 population density formula.
- o Second Tier - funds for capital based on 1970 population - population density formula
- o Bus Capital - funds are only for replacement of buses and related equipment and are apportioned on the 1970 population - population density.
- o Rail - funds are earmarked only for capital projects for commuter railroad or fixed guideway transit services.

Total funding available in FY 1980-1982 for basic is \$900 million. Total funding available in FY 1982 for bus capital is \$455 million. Total funding available in FY 1982 is \$160 million for rail. The federal share is up to 50% of eligible operating cost (excluding operating revenues and certain other miscellaneous sources of financing).

In the past funding was available for operating costs for the four categories. Operating costs for Section 5 will be completely phased out by 1985 on the following basis:

- 1983 - 1/3 decrease of total operating funds
- 1984 - 2/3 decrease of total operating funds
- 1985 - no operating funds available

The changes regarding operating costs reflect the Reagan Administration's policy that local transit operators are to pay their local operating costs and not be subsidized by the Federal government. The Administration has suggested several options to meet these costs - 1) increase the efficiency of the transit system, 2) reduce or eliminate service on inefficient routes, 3) increase fare box rates, and, 4) develop alternative local transit taxes and fees.

Application for available funding requires a two-step process - designation of recipients and formulation of a program of projects, and the submittal of the project application. Applications are submitted to MTC.

B. State

Transportation Development Act - SB 325 - Article 4

Funds are available to major transit operators for capital and operation costs to aid in public transportation research and demonstration to projects.

Funding is provided by the extension of the State sales tax to gasoline and fuel. One-quarter of every cent of the State sales tax is made available for transit development and operation in the county of tax collection. If the servicing population of the transit operation is 700,000 or more, at least 75% of available funds are for capital expenditures. Funds allocated are not exceed 75% of total cost of operation of the system. The total cost of operation is computed after deducting federal grants estimated to be received. MTC is the administering agency for the allocation of funds toward planning, research, capital and operation costs. Grants are 100% funded.

AB 1107 Sales Tax Fund

Under AB 1107, certain counties are currently or have the authority to levy a one-half cent sales tax for public transit purposes. This levy is in addition to the one-quarter cent sales tax provided for by the Transportation Development Act. Santa Clara County implemented a one-half cent sales tax for its public transit system in 1976. San Mateo County Transit District has the authority to levy a one-half cent sales tax. In 1977, the State Legislature extended indefinitely the one-half cent sales tax to the three Bay Area BART Counties.

With the exception of 25% of the sales tax collected in the three BART counties, all sales tax revenues would be allocated for public transit purposes by the county or transit district authorized to levy the tax. The 25% of the one-half cent sales tax in the three BART counties is allocated by MTC with three claimants (San Francisco Muni, BART, AC Transit). The three claimants must meet the following requirements:

- o Fare box revenues must equal at least 33% of operating expenses
- o Claimants must participate in the Transit Operators Coordinating Council (TOCC).
- o Claimants must follow the standards established by MTC related to reporting, submission of budgets to MTC for comment and evaluation, maintenance of levels of established support, operating efficiency, and cost control.

The 25% may only be allocated by MTC to an eligible claimant for transit improvement purposes, provided before, or on, January 1, 1978 (on the basis of regional priorities established).

AB 1879

Senate Bill 1879 (1976) provides funding for construction of public transportation projects. The availability of funds is dependent upon the level of retail sales tax revenue in any one year, a funding formula, and allocation of money by the Legislature. Proposed projects must be submitted to the California Department of Transportation which, in turn, is responsible for submitting a report on the evaluation of the submitted proposed projects for funding by January 10th of each year. MTC's role in this is to establish the priority for projects contained in this program.

Chapter 4.5 Inter-City Corridor Demonstration Program, of SB 1879, provides funding for specific passenger railroad and inter-city improvements in the Sacramento-Stockton-San Francisco corridor and the Los Angeles-San Diego Corridor. The California Department of Transportation is responsible for administration, implementation, marketing and evaluation of the project. Grants are 100% funded.

Article 19

Article 19 allows the State Highway Funds to be used for transit guideway program. The county approved Proposition 5 for the San Francisco-Oakland SMSA Area. 25% of the funds of the State Highway Account may be used for a transportation program. The amount available is not known until the end of this fiscal year. However, CTC will allocate a certain amount of money to the county.

Funds may be used for planning, design, and construction of public transit. BART, San Francisco Muni and SAMTRANS use these funds for planning and design.

SB 620

SB 620 is a bill for transportation assistance. The source of its funding are the "spill-over" TDA revenues for gasoline and fuel. The funds can be used for such projects as fixed guideways, intermodal facilities, and commuter railroads. Funds can be used for both capital and operation expenditures. Applications for these funds are made directly to CALTRANS.

These funds may not be available in the future. The State Legislature is deciding if these funds would be better spent on meeting the State's deficit rather than transit.

State Tidelands Oil Revenues

AB 2973, better known as State Tidelands Oil Revenues, assigns a portion of tidelands oil revenue income to the Transportation Planning and Development Account for capital outlay costs of public transit guideway projects in the amount of \$25,000,000 for each fiscal year. The excess balance of state lands revenues is allocated to the special account for capital outlay, which would be created in the General Fund.

State Tidelands Oil Revenues are expected to increase substantially over the next ten years as a result of oil price deregulation. The possibility exists of diverting some of this money for the support of transit.

C. Local

Tax Increment Financing

Tax increment financing is a method of financing a project within and surrounding a designated redevelopment boundary line. The property tax base is frozen at a specific year. As the property tax base increases, the incremental difference between the frozen tax base and the tax base increase is used to finance redevelopment projects. Tax increment can be used to finance parking structures. It appears it can be used to help meet the City of Oakland's increased transit-related costs on the basis that the improved transit will further enhance the success of the redevelopment projects.

The City Council must approve of the use of tax increment for transit related projects. A bonding firm should be retained to determine the revenues to be generated by tax increment financing.

Sales Tax

The City of Oakland could create a sales tax on all items sold in the City to meet its share of the increase in transit needs. This tax would be in addition to the 6.5¢ sales tax already charged throughout the BART counties. A 2/3 voters' approval is required to enact this tax. It is highly unlikely voters would approve this funding alternative.

Core Area Transit Maintenance Assessment District

The City could create a special assessment district in the downtown area and charge an additional set rate per assessed value on the property tax within the district. The San Francisco Board of Supervisors has approved this approach but it is being contested in the courts. This alternative may be difficult to use since a large share of the downtown is a redevelopment urban renewal project and the City Council would have to approve the creation of the new district.

Transit Impact Development Fee

The City could impose a development fee per square foot on all new development in the downtown area. The fee is on a one time basis. This fee would generate a major source of revenue given the proposed development in the downtown area. The San Francisco Board of Supervisors has approved this approach but is being contested in court.

Payroll Tax

The City could impose a payroll tax on all non-resident employees in the downtown area or throughout the City. The tax would not be imposed on residents employed in the City. This tax would be created to offset transit costs caused by non-residents that otherwise, would be borne by residents. Given the proposed development in the downtown area, this tax would generate a major source of revenue. A voters' approval of 2/3 would be required.

Parking Fees

All or part of the parking fees collected in the downtown area from the existing proposed and additional needed parking spaces could be allocated toward transit.

OAKLAND CENTRAL DISTRICT
TRANSIT SYSTEM IMPROVEMENT STUDY
PHASE I
DATA BASE INVENTORY

June, 1982
(Revised)

DKS ASSOCIATES
in association with
Sedway/Cooke
J. Warren & Associates
Theresa Hughes & Associates

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INTRODUCTION

This working paper presents the results of the data base assessment conducted by DKS Associates with the assistance of John Warren Associates, and Sedway/Cooke.

The data assessment was conducted in two stages: first the personnel of various local agencies were interviewed to determine what data would be available for the study; then copies of all pertinent reports and surveys were obtained where feasible and reviewed for relevancy to the CBD Transit Study. The data was evaluated for completeness, degree of detail, availability, age, and the effort required to update the information and fill in gaps.

The following persons were interviewed by the consultant team:

1. AC TRANSIT: Don Larson, Gene Gardiner, Eric Harris
2. BART: John Stamas
3. City of Oakland: John Soderling, I. Jeeva, F. Ehrhardt, A. Zuckerman, M. Kaplan
4. Caltrans: Frank Tedesco, George Pocopacas
5. MTC: Hanna Kollo
6. Port of Oakland: Charles Boyd

The relevant data resources of each of these agencies are listed in Table I and described in more detail below.

A. AC TRANSIT DATA SOURCES

1. Point Checks

These are unsystematic checks of bus loads and schedule adherence at specific check points, and are conducted by AC Transit's Scheduling Department. About 30 point checks are made a week at different times of the day, at different locations, for different routes, and covering various time periods. In the past (the 1970's) some of these point checks have been assembled into corridor load factors.

These counts are of particular significance to CBD transit planning since they can be used to determine existing passenger peak load factors on CBD bus lines and hence help identify locations of potential future overcrowding.

- o Completeness - Not all downtown routes and cordon points are covered, and dates and time periods of collection vary. Therefore, some new counts may be needed.
- o Degree of detail - Where available, counts are detailed, being recorded by trip.
- o Availability - A considerable amount of work is involved in summarizing the trip-by-trip data for use. Also need to adjust for "average" day conditions.
- o Currentness - Varies.

Table I
DATA RESOURCES

A. AC TRANSIT DATA SOURCES

1. Point Checks
2. Operator Passenger Checks
3. Boarding/Alighting Surveys
4. Fare Checks
5. On-Board Passenger Survey
6. Five Year Plan
7. Future Data Sources (E-Z Data System)

B. BART DATA SOURCES

1. Daily Passenger Ticket Reports
2. Passenger Profile Survey
3. Latent Demand Public Awareness Survey
4. Quarterly Performance Report
5. Annual Report
6. Five Year Plan
7. BART Access Report (Phase III)
8. BART System Performance Study
9. BART Impact Program

C. CITY OF OAKLAND DATA SOURCES

1. Traffic Counts
2. Pedestrian Counts
3. Striping Plans
4. Parking Data
5. Traffic Signals
6. Project Environmental Impact Reports
7. Oakland City Center Project Employee/Employer Survey
8. Oakland CBD Transit and Vehicular Study
9. Parking Report - Oakland CBD North
10. Lake Merritt-Coliseum Development Project
11. Oakland Downtown Shuttle Study
12. Central District Inventory - 1959
13. 701 Business and Industry Survey - 1967
14. Contacts Influential

D. CALTRANS DATA SOURCES

1. Freeway Counts
2. Ramp Counts
3. Sub-regional Model

E. MTC DATA SOURCES

1. 1981 Bay Area Travel Survey
2. MTC Travel Model

F. OTHER DATA RESOURCES

1. 1980 Census Data
2. ABAG Socio-Economic Projections

- o Effort to Update - Not known; may be possible to do so as part of ongoing point checks by Scheduling Department.

2. Operator Passenger Checks

These are systematic counts of the total number of boarding passengers on each run of each bus route made by the bus drivers and organized by the Research and Planning Department. The counts are made on one weekday, one Saturday, and one Sunday each month. The information is reported as a four month average in the Planning Department's service productivity analyses. The most recent available data is for fall 1981. The patronage information cannot be broken down by route segment or bus stop and is therefore of limited value for a CBD specific study.

3. Boarding/Alighting Surveys

These bus stop and route specific counts of boarding and alighting passengers are done fairly infrequently on an as needed basis by bus drivers or special personnel. The bus driver surveys tend to be done only on the less travelled routes since the surveys can cause delays. About five routes a month are surveyed on the average. The surveys are made for UMTA Section 15 requirements and for Planning Department purposes. Data is of limited value for CBD study.

4. Fare Checks

AC Transit has about 180 electronic fare tallying boxes all on buses in its Richmond Division (Division 3). These boxes give a tally at the end of the day (on cash register type paper rolls) of the number, type and amount of fares collected on each bus. Since a single bus may make several runs on different routes in one day, the daily fare data cannot be traced to individual routes or runs. A few denominator tally boxes are also available on a rotational basis for buses not equipped with the electronic fare boxes. Data is of limited value for CBD study.

5. On Board Passenger Survey (1978)

About 33,000 passengers on 10 percent of AC Transit's bus trips were successfully surveyed in September 1978. The survey provides good system-wide information on passenger characteristics but the sample size is not large enough to provide accurate bus route or bus stop specific information on patronage. The survey asked questions regarding boarding and alighting bus stops, access mode, fare paid, number of transfers, frequency of bus use, trip purpose, income, ethnicity, age, and car availability. The data is coded to the MTC 440 zone system.

The Fremont and Newark portions of the survey were updated in 1980-81.

- o Completeness - Covers whole AC District on a sample basis.
- o Degree of detail - Provides detailed information on system-wide basis, but cannot be stratified by route.

- o Availability - The data is currently stored on AC Transit's Hewlett-Packard 3000 computer. The data can be pulled (on an overnight run only) using the SPSS statistical package.
- o Currentness - Probably adequate on system-wide basis for most purposes. But individual routes have been modified and fares have been changed since survey. Therefore, results should be used with some caution.
- o Effort to Update -Extensive effort required in order to re-do. Focused CBD surveys would be more appropriate. May be preferable to re-tabulate existing results for CBD trips only, rather than update.

6. Five Year Plan

The five year plan is updated annually. The most recent edition is a draft plan for 1983-87. AC Transit's service Productivity Analyses are summarized by route in the plan. Also contains useful information on route descriptions, finances, planned changes, etc.

7. Future Data Sources

AC Transit hopes to have the "E-Z Data" system up and operating by September 1982. This system uses hand held electronic tally boxes for field collection of the data which is then electronically transmitted to a master computer. Data items 1, 2, 3 above may be collected on this system.

B. BART DATA SOURCES

1. Daily Passenger Ticket Reports

Each day the origin station, destination station, entrance time, and exit time of each passenger are obtained and stored in the central computer. The above information can be printed out in most any format. BART currently obtains the following daily reports (among others):

a) Station of Origin Data Summary (Report #T10008)

A station-to-station O-D table of daily passenger trips.

b) System Passenger Report (Report #T3501)

Daily passenger trips, fares, and trip length by East Bay, West Bay, Transbay, AM peak, Midday, PM peak and evening periods.

c) Hourly Passenger Report (Report #T3504)

Hourly entries and exits by station and/or groups of stations.

d) Screen Crossings by 10-Minute Interval (Report No. T08503)

Passengers, trains and resulting load factors by 10-minute interval over the day, summarized by direction at five screenline locations. (Part of the "PFM" family of programs.)

e) Screenline Crossings by Train (Report No. T08504)

Similar to (d) except data is given by train rather than by 10-minute interval and is therefore more detailed. (Also, part of "PFM" family.)

Reported information is complete, up-to-date and readily available. It may also be possible to obtain special reports, if needed, including historical data from a special history file.

2. 1980 BART Passenger Profile Survey VII

A biennial on-board survey. Last available survey (May/80) obtained a sample of roughly 12,300 BART passenger trips. Another survey has been conducted in 1982 but is not yet tabulated. The survey is designed to sample passengers on a per trip basis so a few people have been sampled more than once. The questions on the survey included origin, destination, boarding station, alighting station, mode of access, trip purpose, frequency of BART use, working hours, weekend use, age, income, ethnicity, and education. Origin-destination data is coded by Census Tract.

3. Latent Demand/Public Awareness Surveys

A biennial telephone survey (most recent is 1981) of about 1000 households in San Francisco, Alameda, and Contra Costa County. The survey asked questions about mode choice, access to transit, work location, travel time, work hours for home to work trips. Other questions relate to knowledge of BART, sensitivity to service and price changes, and satisfaction with BART. Questions were also asked about the socio-economic characteristics of the respondents.

4. Quarterly Performance Reports

These quarterly reports summarize BART performance in terms of reliability, load factors, equipment availability, crime incidents, and operating costs. The reports are issued by the Research section of the Department of Planning and Analysis.

5. Annual Reports

The BART annual reports give annual information on patronage, revenues, fleet availability, and costs.

6. Five Year Plans

These plans are updated annually. They contain cost/revenue data, a system performance evaluation, plus a description of proposed system improvements. Annual summary data on system reliability, schedule adherence, seated capacity, patronage, peak line load factors and parking utilization at stations are included in the five year plans.

7. Bart Access Report (Phase III)

This May 1981 report evaluates passenger access at MacArthur, 19th Street, 12th Street, and Lake Merritt stations among others. The daily entries and exits, mode of access, and peaking characteristics of each station are given in the report. For each station, the

current and future access problems are evaluated and an access plan is proposed for mitigating these problems.

8. System Performance Study (1982-1984)

BART has begun a two-year study designed to determine how to optimize the capacity and performance of the existing system.

9. BART Impact Program

A series of studies of BART transportation, land use, and socio-economic impacts were conducted in the early to late seventies. One of the study reports covers the results of the 1977 Work Travel Survey and estimates the existing and potential BART home-work mode split for different origin-destination pairs.

C. CITY OF OAKLAND DATA SOURCES

Unless otherwise noted, all of the data described in this section are available for inspection and reproduction from the City of Oakland Department of Public Works, Traffic Engineering and Parking Division.

Generally, geographic coverage and quality of data is good. Currentness of the data is not very good due to a lack of City staff resources but the data is, for the most part, usable. The only reservations about the data would be applicability in the City Center vicinity due to the wholesale realignment of traffic circulation patterns or in any other areas where substantial development has occurred or will occur within the time frame of our study.

1. Traffic Counts

a. Current Traffic Volumes

The City collects and compiles traffic volume data through counts obtained by placement of mechanical counters at street locations of interest for a 24-hour period. The output is a count summary broken down hourly during the offpeak periods and into 15-minute intervals during the morning and afternoon peak periods. The outputs of paper tapes affixed on forms are filed by street location in binders.

The counting program has not been systematically done since 1977, thus resulting in fewer recent counts. However, coverage of the downtown area is generally good and the counts are reasonably applicable to present conditions. Short of getting new traffic counts, factoring or sample adjustments of these counts may be necessary to obtain more acceptable numbers for specific locations in vicinities that have undergone much change recently.

A reproducible map covering the entire city with special detail on the downtown area illustrating average daily traffic on major streets is produced on a periodic basis by the City based upon the traffic counts described above. The current map is for year 1980 with 1979 freeway traffic data.

b. Intersection Turning Counts

The City conducts these counts on an "as needed" basis. Also, numerous intersections have been counted by others for recent EIR's. Generally, most problem intersections in the downtown area are covered. The counting data forms are filed by intersection location in binders.

2. Pedestrian Volumes

The City has conducted pedestrian counts at signalized intersections during normal working hours within the downtown area. This program is no longer active with the last updating occurring in 1980. These counts are summarized on forms filed by intersection location in binders.

A reproducible map covering the downtown area showing pedestrian volumes at these intersections is available. The last updated map was produced in year 1980.

3. Street Striping & Signing

Major streets are covered by 50 scale reproducible strip maps which show the current pedestrian and auto striping, lane widths, signing details, curb markings and channelization.

Most streets within the downtown area are covered by these maps. The City updates these maps periodically.

4. Parking Data

a. On-Street Parking Inventory and Occupancy

Metered areas within the City are shown on a nonreproducible map in the Traffic Engineering Department. Extents of metered areas are high-lighted in red or orange color on this map. The metered parking spaces within these areas are detailed on reproducible strip maps which indicate number, site and locations of each space. Both maps are periodically updated by City staff.

The on-street parking occupancy studies are no longer pursued on an on-going basis. The last comprehensive citywide parking survey was done in 1977. The data were transcribed into tabular form and filed by District. Summaries were prepared for each district as well as city-wide. Some recent surveys were conducted in isolated areas such as Victorian Row and Chinatown areas of downtown since then.

Unmetered parking usage has not been studied extensively in the downtown area.

b. Off-Street Parking

All off-street parking facilities within the downtown area have been inventoried and are shown by a reproducible inventory map. The current map is for year 1979 but it is in the process of being updated by City staff. The data shown on this map are type of facility (lot or garage, public or private), location, and number of spaces.

Full-scale off-street parking usage surveys have not been conducted on a comprehensive basis by the City since 1979. Recently, the City has surveyed isolated spots such as Victorian Row and Chinatown but it has not updated the 1979 usage inventory.

This inventory is obtained by field observations by City staff and recorded on summary sheets that are filed in a binder at City Hall. The data shown on these sheets are type of facility, ownership, use, i.e., private or public, location, operation type, number of spaces, duration, fee, collection method, occupancy and sketch.

5. Traffic Signals

The downtown area signal system is centrally controlled. Major streets which are signalized have time-space signal progression diagrams. These diagrams are in reproducible standard drawing form.

Signalized intersection locations within the city are plotted on a non-reproducible wall map. However, a listing of these locations and details of timing and signal phasing is available.

6. Project Environmental Impact Reports

About half a dozen environmental impact reports or traffic impact studies have been prepared for various projects in downtown Oakland. These reports generally contain an inventory of existing traffic and transit conditions within a few blocks of the proposed project. These reports also estimate the likely transportation impacts of the proposed project.

These EIR's however are generally limited in scope and there is a great deal of fluctuation in the detail and depth of analysis between reports. Different reports often use different assumptions and measures of traffic conditions and thus cannot easily be combined to yield a total picture for the Oakland CBD.

The projects for which recent impact reports have been prepared are:

- a. Raymond/Kaiser Engineers Buidling (19th/Harrison)
- b. Kaiser Center (20th, Grand, Webster, Harrison)
- c. Transpacific Center (10th/Franklin)
- d. Lake Merritt Plaza (20th/Webster)
- e. Convention Center/Hotel (11th/Broadway)
- f. Alameda County Courthouse (7th/Clay)

Copies of these reports will be available through the City.

7. Oakland City Center Project Employee/Employer Survey (1981)

This survey of employees and employers in the Clorox and Wells Fargo Buildings was conducted by Barton Aschman Associates in late 1981 for the Grubb and Ellis Company. Approximately 30 employers and 1,300 employees in the two buildings returned completed survey forms.

The employer questionnaire focused on working hours, number of employees, numbers of overnight guests, and the employers' desire to participate in a ridesharing program. The employee survey focused on their travel and parking characteristics, lunch time activities, and after work activities.

8. Oakland CBD Transit and Vehicular Study (1975)

This 1975 study by the City of Oakland Traffic Engineering Department provides summary data on the total number of cars, AC Transit passengers, and BART passengers entering and leaving the Oakland CBD on a typical weekday. Information on AC Transit patronage by hour of day, the number of transfers to BART, and the number of AC Transit "through" passengers is also presented in the report.

9. Parking Report - Oakland CBD North (1973)

This 1973 parking study by DeLeuw, Cather and Company covered a 50 block area of the North Oakland CBD between Grove, Grand, Harrison, and 14th Streets. The study inventoried on and off-street parking spaces, parking accumulation, and parking duration. Although no firm parking demand projections were made, the study developed a flexible 10 year program for expanding parking facilities in the North CBD.

10. Lake Merritt - Coliseum Development Project (1978)

This development study for the areas surrounding the Lake Merritt and Coliseum BART stations, originally conducted in 1975-76, makes several recommendations for a new circulation plan for downtown Oakland. The transportation impacts of the recommended development plans for each of the BART station neighborhoods were forecasted for the year 1990.

The study generally focused on the portion of the Oakland CBD southeast of Broadway and Fourteenth Streets. Employment, population, and other detailed socioeconomic data were developed and projected for this area.

Since the time of this study, proposals for development of the Transpacific Center have changed significantly, and several other proposals have been submitted within the study area, so that the projections are now out-of-date.

11. Oakland Downtown Shuttle Study (1980)

This study by DKS Associates evaluated the feasibility of running a shuttle bus service in downtown Oakland from Kaiser Center to Jack London Square. Boarding/alighting surveys and delay studies were made of selected downtown bus lines. Traffic volumes and peak hour levels of service were analyzed for critical intersections along Broadway both for existing conditions and for bus lanes on Broadway. The feasibility of traffic signal preemption by buses was also analyzed.

12. Central District Inventory - 1959

Data contained in the inventory consist of: (a) parcel information classified according to ownership, occupancy, and type of development and related locational information such

as assessor block and parcel number and census block number; (b) building (structure) information classified by type, height and condition; and (c) establishment (i.e., specific firms) information including amount of floor space and number of employees classified by Standard Industrial Classification (SIC) categories. Information is recorded on two sets of cross-referenced data sheets; the first containing parcel and building information and the second establishment information.

13. 701 Business and Industry Survey - 1966

The central district was included as part of a comprehensive citywide inventory. Information contained in the 1966 inventory adheres to the same data breakdowns as the 1959 survey. Data has been merged with other information and placed in a computerized file (OPINS file).

14. Contacts Influential

Data on the Oakland Central District is maintained by a private firm, Contacts Influential. Data includes establishments classified by Standard Industrial Classification categories and the number of employees in each SIC category. The data is compiled by U.S. Post Office ZIP zones. The information is also recorded by street address which permits reaggregation of the data in other ways.

15. Procedure for Updating Land Use Inventory

Phase II transit studies will require preparation of an updated land use inventory for the Central District in order to: (a) project future person trips generated by Central District land use and (b) to document the current land use and land utilization pattern and the options for accommodation projected growth. This same information is essential for other elements of a comprehensive Central District Development Program.

Five data sources on file in the Department of City Planning provide the basis for the land use update. These sources are:

1. The 1959 Central District Land Use Inventory which records, by parcel, information for each building occupying the parcel and the types of uses occupying the building (see Data Source #12).
2. The 1966 OPINS File Data which contains equivalent information to the 1959 inventory (see Data Source #13).
3. The 1979 Facility Type (Land Use) Map which maps generalized land use and records number of stories for each building. This map is accompanied by work sheets which identify changes from 1966 to 1979.
4. The 1959-1979 Land Use Changes Map which identifies land use changes for these dates. Dates of change are indicated for the respective parcels.
5. The 1979-1982 Land Use Changes Form which records changes by major land use categories.

The above information could be used as a base to update the land use information. Unlike the prior 1959 and 1966 surveys, which consisted of a comprehensive survey of every business establishment in the central district, the Phase II land use analysis could instead be limited to documentation of the new or remodeled buildings and the amount and type of space, i.e., ground floor commercial, ground floor office, upper floor office, residential space.

Necessary information on employment could be generated by applying average floor space factors per employee to the new or remodeled space. This would be added to the employment shown in 1959 or 1966 data file where change has not taken place. Additional allowances would be made for major building space shown as vacant in 1966 which is now occupied and conversely adjustments made for space vacated since 1966.

Current land use could be estimated based on building space type. Where change has not taken place the original 1966 or 1959 data would be used. For building space added or altered since 1966 land use estimates would be based on space type. Limited field investigations and professional judgment would be used to make these determinations. For example, functional differences by block or street frontage such as banking establishments along 20th Street and retail along Telegraph Avenue would be noted and ground floor space assigned to appropriate land use categories. This would provide the basis for determining trip generation. It would also provide the baseline information needed for land use and market and growth analyses.

The basic steps needed to update the land use files are shown below. The Department of City Planning is currently investigating the feasibility of retrieving the 1966 land use data. If found to be feasible this could provide the baseline for the update. If problems are encountered in retrieving the data in a useable form the 1959 data file could be used instead.

- a. Using the 1959-1979 Land Use Change Map identify all changes made since either 1966 or 1959.
- b. Using the work sheets accompanying the 1979 Facility Type Land Use Map determine the type of changes and document the type of structure constructed or remodeled. The documentation shall include calculation of ground floor and upper floor space. These calculations may be made either from field surveys or from building permit records.
- c. Review the status of major structures shown with vacant space in the 1966 or 1959 file and determine current status of this space.
- d. Through interviews with building managers and real estate firms identify major vacant spaces.
- e. Create new land use data file by deleting structures demolished or parking areas removed from either the 1966 or 1959 file. Add new construction, new surface parking, and changes in space type of existing structure, e.g., industrial to office. All information should be recorded by parcel to enable aggregation into whatever statistical areas are needed for respective analyses.

(Note that Tasks (c) and (d) are not necessary for transportation analysis purposes since these studies should assume normal occupancy of the existing and projected building space as the basis of the analysis. However, for land use purposes it is important to know the relationship between market demand for space and space already available to meet this demand.

D. CALTRANS DATA RESOURCES

1. Freeway Counts

Mainline freeway traffic counts are published by Caltrans annually. They provide information on average annual daily traffic, peak month daily traffic, and peak hour volumes. No directional information is provided. Most count information is factored up from previous counts. District offices tend to have more reliable count information on file.

2. Ramp Counts

Traffic volume information for freeway and off ramps are available at the district offices only.

3. CalTrans Sub-Regional Model

CalTrans has for a number of years used its Sub-Regional Model to project future highway facility needs. It is currently, for the first time, developing its sub-regional travel projections using the MTC Forecast Model. A joint effort with MTC staff is currently underway to develop projections for Alameda and Contra Costa Counties.

The model is being scaled down from the MTC 440 zonal system to a CalTrans zonal system that approximates census tracts. In the downtown Oakland area there is approximately an exact correspondence between the zones with a few instances where multiple CalTrans zones are nested within a single census tract zone. Both CalTrans zones and census tracts nest within MTC's 440 zone system.

The model base year is 1975 with the projection year being 2000. The projections will be based on forecasted socio-economic data by ABAG ("Projections 79"). The model uses a total of 71 variables, 35 of which are input variables.

Output of the sub-Regional Model is Home Based Work (HBW) trips stratified by mode. Three modes are given: Drive Alone, Shared Ride and Transit. The network used is at the level of "mini-corridors", i.e., a number of major streets in downtown Oakland are combined with lesser parallel streets in a single "mini-corridor". The traffic projections consequently are not street specific but relate instead to total traffic in the mini-corridors. Ramp traffic is also included. Some of the "mini-corridors" in Oakland include:

- o 27th Street
- o 14th Street
- o 7th (or 8th) Street

- o Broadway
- o Telegraph Avenue
- o San Pablo
- o Market Street
- o Peralta
- o Adeline Avenue
- o Route 580
- o Route 24
- o Route 17

It should be noted that ADT is not an output. While peak-hour volumes, as such, are not output, they can be factored from HBW Trips (which usually account for about 80 percent of the total peak hour volumes). Where a peak-hour factor is known for existing traffic, it may be possible to develop ADT. This may not provide for changes in land uses and travel patterns.

As indicated earlier, mode split is a model output. A mode-split sub-model utilizes data on travel time, transfer and wait time and cost of fares.

- o Completeness - The model covers Alameda and Contra Costa Counties.
- o Degree of Detail - The sub-regional zones approximate census tracts (or are smaller). There are 370 CalTrans zones in Alameda County compared to 440 in the MTC zonal system covering nine counties. HBW Trips are output for drive alone, shared ride and transit. Output of assigned traffic volumes for freeway ramps, freeways and a number of Oakland downtown "mini-corridors" will be available. Peak-hour volumes can be factored from HBW Trips. ADT is not available.
- o Availability - Some preliminary results have been generated but corrections and adjustments are still being made. Output should be available well before the beginning of Phase II of the Central District Study.
- o Currentness - The data will represent the most recent projections, at a sub-regional level, for Alameda County and Oakland. The base year is 1975 and the projections are being made to the year 2000.
- o Effort to Update - The MTC Travel Model being used is complex and difficult to update. Any update beyond the current CalTrans effort would require considerable effort and time.

E. MTC DATA RESOURCES

I. Bay Area Travel Survey

This was a telephone and trip card survey of roughly 7000 households (20,000 persons and 82,000 unlinked trips) in the nine county San Francisco Bay Area by Crain and Associates. One half of the random sample was drawn from San Francisco. The remainder of the sample was drawn from each county in proportion to the number of households in each county.

The survey was conducted in two parts. First, each household that agreed to participate in the study was asked for the usual socio-economic data. Then each household was asked to tally their trips on a pre-selected day. Trip data included: origin, destination, mode, purpose, time of trip, duration of trip, persons per vehicle, type of parking facility, parking cost, fare, transfers, and wait time for transit.

2. MTC Travel Model

The MTC Forecast Model (actually a series of linked sub-models) was developed to support its regional transportation planning efforts. It is available for planning uses at smaller scale but this requires a substantial amount of additional effort and the provision of data at a smaller zonal system (MTC runs the model on a regionwide system of 440 zones as shown on the next page. Only about 3 zones are located in downtown Oakland). The model is being modified by CalTrans to use in its sub-regional planning efforts.

To date the model has been used to produce a 1975 simulation based on a 1975 data base, at the 440 zone level. Currently MTC has no plans for doing future year projections except as requested for specific transportation studies within the region. Examples of this are the Guadalupe Corridor study in Santa Clara County and the CalTrans sub-regional modeling efforts which include Alameda and Contra Costa Counties.

- o Completeness - The nine county Bay Area is covered but at a 440 zone level.
- o Degree of Detail - The zones are large and not intended for localized planning. They are not coterminous with Central District boundaries. The model does produce numbers of transit work trips and total commuter work trips on a zonal interchange basis. Trip tables are available at the 440 zone level,* on a super district level (a super district is comprised of several zones) and at the county level. No check of Oakland data for reasonableness has been done yet.
- o Availability - Trip tables from the 1975 simulation are available at the MTC offices.
- o Currentness - Currently available data is from the 1975 simulation.
- o Efforts to Update - The model is complex, utilizing 71 variables, 35 of which are input variables. To utilize the model at a scale appropriate to the Central District Study, the 35 input variables would have to be adjusted to a smaller zonal system. Judging from the experience of CalTrans in adapting the model for sub-regional use, a considerable amount of effort and time would be required.

* These are aggregations of 1970 Census Tracts.

F. OTHER DATA RESOURCES

I. Census Journey to Work Data

The 1980 Census Urban Transportation Planning Package is expected to be available in approximately nine months. This package, more commonly referred to as the "Census Journey to Work Data" is a special tabulation of census data for individual SMSA's, tailored to geographic areas that are used in transportation planning. Local transportation planning organizations may submit their zonal requirements (i.e., traffic zones or census tracts) to the Census Bureau. The Bureau will produce a standard set of tabulations for the planning area on a cost reimbursable basis. The Metropolitan Transportation Commission intends to purchase this package for the nine county Bay Area with zones at the census tract level.

The "Journey to Work Package" is comprised of six parts with each part having tabulation ranging in number from six to thirty. Each tabulation is comprised of data items ranging in number from 14 to 11,642. Table 2 shows the overall contents of the package.

Table 2
URBAN TRANSPORTATION PLANNING PACKAGE 1980 CENSUS

<u>PART</u>	<u>DESCRIPTION</u>	<u>TABULATIONS</u>	<u>DATA ITEMS</u>
I	Tabulation by census tract or block group (or zone-special order) of residence.	30	778
II	Tabulation by large geographic areas of residence.	19	11,642
III	Tabulations by census tract (or zone-special order) of work.	14	517
IV	Tabulations by census tract of residence to census tract of work (or zone of residence to zone of work-special order).	6	14
V	Tabulations by block group of work (sub-totals to census tract of work or zone of work-special order).	7	107
VI	Tabulations by county of residence to county of work (includes 20 external counties with a large number of journey-to-work trips)	12	322
<u>TOTAL</u>		<u>88</u>	<u>13,380</u>

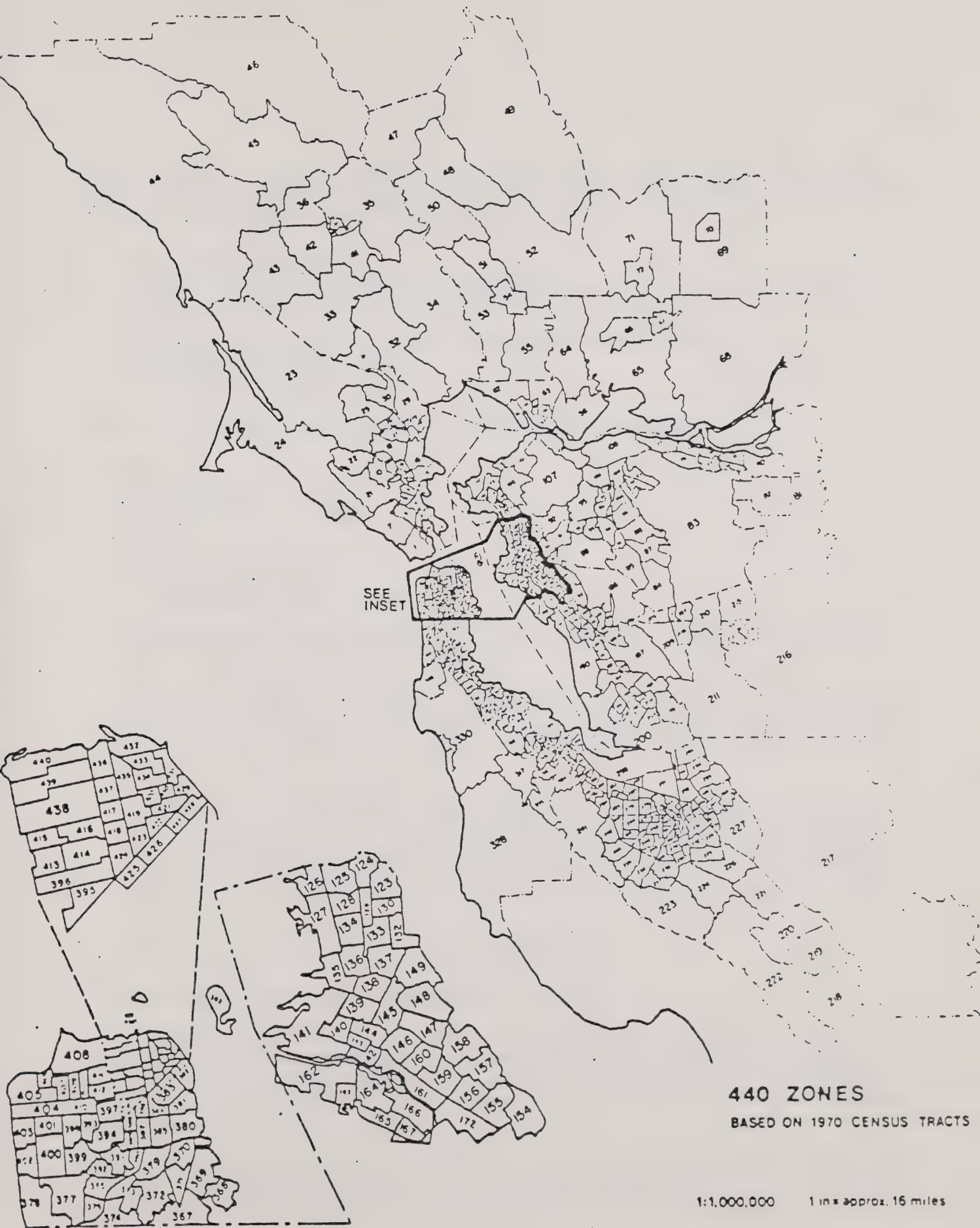


FIGURE 1

Of the six parts, Part IV, "Tabulation by census tract of residence to census tract of work," seems most appropriate for the needs of the Central District Study. A total of six tabulations will be produced, at the census tract level:

1. Total number of workers
2. Number of worker by means of transportation
3. Number of worker not working at home by mean travel time and mode of transportation.
4. Number of vehicles (cars, trucks, or vans) used in travel to work.
5. Number of persons per vehicle.
6. Number of persons per carpool.

These tabulations will be subtotaled for the following geographic areas:

- o CBD
- o Central City
- o Area (Urbanized or Study)
- o County
- o SMSA
- o Within Commutershed
- o Outside Commutershed

- o Completeness - The data provided will cover the CBD study area as well as its commutershed at the census tract level.

- o Degree of Detail - Travel data for work trips will be produced from census tract of residence to census tract of employment. The means of transportation, vehicles used, vehicle occupancy, total person trips and average travel time will be provided.

- o Availability - It is estimated that the package will be available from the Census Bureau in about nine months. MTC intends to purchase the entire package for the entire Bay Area, with geographic detail at the census tract level. Other potential users may also purchase the portions of the package they desire, tailored to their specifications regarding overall geographic area and degree of detail (i.e., traffic zone).

- o Currentness - The data is based on the 1980 census.

2. ABAG Land Use, Population, Employment Projections

The Association of Bay Area Governments periodically produces projections of land use, population, employment and housing for the nine Bay Area counties. This data is used as an input to MTC's transportation modeling program. The latest results are published in "Projections 79: 1980-2000 Population, Employment, Housing for the San Francisco Bay Area," dated January, 1980.

The model that generates these projections is based on the same 440 zonal system used by MTC. Correspondence tables are provided for census tracts, several of which typically nest within an ABAG zone. The 440 zonal system is shown in Figure 1.

A base year of 1975 was used with projections given every five years up to the year 2000. The model output is on a zone basis, by county. Specific output includes:

- o Housing Units
- o Resident Population
- o Group Quarters Population
- o Employed Residents
- o Non-working Population
- o Total Employment
- o Basic Employment
- o Local Serving Employment
- o Total Population

APPENDIX A RELATED STUDIES

LIST OF REPORTS/STUDIES RELATED TO OAKLAND CENTRAL DISTRICT TRANSIT STUDY

Transit

1. AC Transit Five Year Plan, FY 1982-83, AC Transit, 1981.
2. AC Transit Five Year Plan, FY 1982-86 (Draft), AC Transit, 1982.
3. 1981 BARTD Short Range Transit Plan for Period July/81 to June/86 (Final Draft), BARTD, 1981.
4. BART Access Report, Phase III, BARTD, 1981.
5. Oakland Downtown Shuttle Study, DKS Associates, 1981.
6. Oakland CBD Transit and Vehicular Study, Oakland Dept. of Public Works, 1975.
7. Preliminary Feasibility Analysis of the Oakland Transportation Terminal Project, JHK & Associates, 1982. (Not available for use at this time.)
8. AC Transit On-Board Survey--Final Report, Crain & Associates, 1979.
9. Quarterly Performance Report on System Objectives, BARTD Dept. of Planning and Analysis, updated quarterly.
10. BARTD System Performance Study, BARTD Dept. of Planning and Analysis, 1980 (proposed study work scope).
11. 1980 BART Passenger Profile Survey VII, Decision Research Institute, 1980.
12. 1981 Latent Demand and Public Awareness Survey for BARTD, Decision Research Institute, 1981.

Area Studies and Plans

1. Lake Merritt-Coliseum Development Project, Volumes I (Final Report) and II (Consultant Report), Gruen Gruen & Associates, Robert Conradt, et al, 1978. (Not adopted.)
2. Central District Urban Renewal Plan (City Center, Chinatown, Victorian ROW), Oakland Redevelopment Agency, 1979.
3. Bay Bridge Terminal -- Oakland Army Base Traffic Reconnaissance Study, DKS Associates, 1979.
4. Parking Report -- Oakland CBD North, De Leuw, Cather & Company, 1973.
5. Oakland Policy Plan, City of Oakland, 1980.

6. Transportation Input Study for Closure of 10th Street and Transfer of Development Rights Over Franklin Street as a Part of Hong Kong USA, Oakland Public Works Dept., 1975.
7. Capacity Analysis of Intersections of Brush and Castro at 5th through 14th Streets -- With and Without Grove Shafter Freeway, Oakland Public Works Dept., Undated (Recent).
8. CBD South--Chinatown Parking Study, Oakland Dept. of Public Works, 1982.
9. Southwest CBD Parking Study, Oakland Dept. of Public Works, 1982.

Project Reports and EIR's

1. Preliminary Draft Environmental Impact Report--Kaiser Center, Environmental Impact Planning Corporation, 1982.
2. Draft Environmental Impact Report--TransPacific Centre, Environmental Impact Planning Corporation, 1982.
3. Preliminary Draft Environmental Impact Report--Lake Merritt Plaza (2 Volumes), Environmental Impact Planning Corporation, 1982 (2 Volumes).
4. Final Environment Impact Report for the Raymond-Kaiser Engineers Building, Environmental Science Associates, Inc., 1982 (plus separate volume containing preliminary draft transportation impact study).
5. A Transportation Study of the Proposed Convention Center/Hotel, TJKM Transportation Consultants, 1979.

Travel Models

1. Travel Model Development Project--Phase 2 Final Report Vol. 1: Summary Report, Cambridge Systematics, 1980.
2. Travel Model Development Project--Phase 2 Final Report Vol. 2: Detailed Model Descriptions, Cambridge Systematics, 1980.
3. Travel Model Development Project--Phase 2 Final Report Vol. 3: MTC FCAST User's Guide, Cambridge Systematics, 1980.
4. Guadalupe Corridor Alternatives Analysis, Working Paper No. 4, Volume 1, Travel Model Development and Validation, Metropolitan Transportation Commission, 1980.

Surveys

1. 1981 Bay Area Travel Survey, Crain & Associates, 1981.
2. Transportation Survey--Oakland City Center (tabulations only), Barton-Aschman Associates, 1981.
3. Kaiser Center Employee Travel Survey, DKS Associates, 1981 (not published).
4. See also, items 8, 11, 12 under "Transit."

Land Use/Demographics

1. Projections 79: 1980-2000, Association of Bay Area Governments, January 1980.
2. Annual Planning Report, 1981, State of California Employment Development Department.
3. Development Program for Jack London Square, Oakland, California (updated), The American City Corporation.
4. Bay Area Office Growth, Association of Bay Area Governments, April 1981.
5. The Oakland Central District Plan, City of Oakland 1966.

APPENDIX B

SAMPLE DATA FORMATS

AC Transit Passenger Counts

#1

ALAMEDA-CONTRA COSTA TRANSIT DISTRICT
CHECK OF HEADWAY AND PASSENGERS CARRIED

1 of 2 Sheets

FORM 137R

Route 51-58 Date 2-1-82 Day of Week Monday
Location 40th & Broadway Weather CLEAR Observer M. KAM

TO <u>BERKELEY</u>										FROM <u>BERKELEY</u>									
ARR <u>6:00A</u>					DEP <u>2:00P</u>					ARR <u>6:00A</u>					DEP <u>2:00P</u>				
DEST.	EQPT. NO.	SCH. NO.	SEATS	LV. PASS.	TIME	AHEAD	ON SCH.	LATE		DEST.	EQPT. NO.	SCH. NO.	SEATS	LV. PASS.	TIME	AHEAD	ON SCH.	LATE	
51A	900	2	51	14	619		✓			51	1030	11	47	4	616		✓		
			51	14									47	6					
51m	1008	1	47	15	636		✓			58	1042	7	47	12	633		✓		
51A	1012	14	47	23	648		✓			58	672	20	51	15	647		✓		
51m	1057	15	47	35	659			1					98	27					
			141	73						51	1004	18	47	15	703		✓		
51A	1040	12	47	38	708		✓			58	1009	3	47	28	716		✓		
51m	1046	13	47	30	716		✓						94	43					
51A	1029	19	47	46	727		✓			51	673	4	51	31	730			1	
			141	114						58	1011	17	47	38	741		✓		
51m	1030	11	47	30	734		✓			51	900	2	51	26	751	3			
51B	980	1	51	20	734			2					149	95					
51	528	18	51	2	740		✓			58	1008	1	47	22	804		✓		
51A	674	9	51	24	742		✓			51	1135	16	47	39	812		✓		
51m	675	10	51	38	750			1		58	1057	15	47	31	822			1	
51	1042	7	47	26	758			3					141	92					
			298	140						51	1012	14	47	24	831			2	
51m	1061	8	47	39	804			2		58	1046	13	47	20	836	1			
51	312	5	51	(54)	812			3		51	1040	12	47	18	846			1	
51	672	20	51	48	819			4		58	1030	11	47	33	854	1			
51B	187	13	48	6	821			2		51A	528	18	51	72	855	3			
51m	903	6	51	42	821			1					279	107					
51A	501	5	51	0	826		✓			58	675	10	51	10	811	1			
			299	249						51	674	9	51	11	920	2			
51B	1022	11	47	11	833		✓						102	21					
51	791	9	45	48	838	1													
51m	1004	18	47	29	840			5											
51A	1009	3	47	31	845			3											
51B	978	14	51	3	846	2													
51m	673	4	51	37	853		✓												
			288	159															
51	1029	26	47	14	903			4											
51A	1011	17	47	26	907			4											
51m	900	2	51	36	910	3													

REMARKS:

328K 9:30-9:45a

41

ALABAMA-LUTHER LUTHER TRAFFIC DISTRICT
SERVICE PERFORMANCE
TRAFFIC CHECKERS WEEKLY SUMMARY

PAGE 1 OF

MONTH: JAN 31 1982 TO FEB 06 1982					% OF ON-TIME OPERATION (2) - (1)=(3)			% LOAD FACTOR - (5) - (4)=(6)					
DAY	DATE	ROUTE	LOCATION	TIME	(1) TOTAL TRIPS	EARLY	LATE OVER 5	(2) ON-TIME TRIPS	(3) % TRIPS ON TIME	(4) SEATS	(5) PASSENGER LOAD	(6) LOAD FACTOR	CHECKER
SUN	1-31-82	211	S.F.E.T.	11:00-11:00	72	0	0	72	100%	3737	450	25%	E. STEVENS
MON	2-1-82	15, 18	L. Shure & P. Mac	6:30-10:00	75	20	5	50	67%	3548	1846	52%	E. STEVENS
MON	2-1-82	15, 18	L. Shure & P. Mac	2:00-6:00	82	11	19	52	63%	3845	2359	61%	E. STEVENS
MON	2-1-82	56, 58	Vol. & Edm.	6:00-2:00	43	14	8	21	49%	2542	2452	56%	M. DEAM
MON	2-1-82	56, 58	Vol. & Edm.	6:00-2:00	7	0	0	7	100%	342	457	75%	S. P. LOCKE
TUES	2-2-82	C.F.	S.F.E.T.	11:50-6:00	58	2	1	55	95%	2984	2271	76%	E. STEVENS
TUES	2-2-82	C.F.	S.F.E.T.	6:30-8:30	14	0	1	13	93%	751	702	95%	E. STEVENS
TUES	2-2-82	57	WART. MAC.	6:30-11:00	19	0	1	18	95%	940	432	46%	A. SMITH
TUES	2-2-82	57	WART. MAC.	2:00-6:00	24	3	8	13	54%	1166	167	46%	A. SMITH
TUES	2-2-82	37, 51	Sham. & Kitt	1:30-10:00	36	6	2	28	78%	1789	466	26%	M. DEAM
TUES	2-2-82	37, 51	Sham. & Kitt	2:00-6:00	31	1	4	26	84%	1488	951	64%	M. DEAM
WED	2-3-82	72	W. & L. S. P. 60	6:30-10:00	21	5	2	14	67%	1007	525	52%	A. SMITH
WED	2-3-82	72	W. & L. S. P. 60	2:00-6:00	29	3	8	18	62%	1386	791	57%	A. SMITH
WED	2-3-82	Q. J.	WART. DET. MAC.	6:00-2:00	40	9	4	27	68%	1746	284	16%	M. DEAM
WED	2-3-82	F	S.F.E.T.	11:50-6:00	44	0	6	38	86%	2245	1568	70%	M. DEAM
THURS	2-4-82	61, 1-2	Sham. & Kitt	6:30-10:00	17	1	5	11	65%	1013	363	36%	E. STEVENS
THURS	2-4-82	61, 1-2	Sham. & Kitt	2:00-6:00	13	0	11	2	15%	623	181	29%	E. STEVENS
THURS	2-4-82	40	21 & Tele	6:30-10:00	67	21	6	34	56%	2057	1247	42%	A. SMITH
THURS	2-4-82	40	21 & Tele	2:00-6:00	72	11	27	34	47%	3438	1833	53%	A. SMITH
THURS	2-4-82	69, 70	Sham. & Kitt	6:30-10:00	28	4	1	23	82%	1243	547	44%	E. STEVENS
THURS	2-4-82	69, 70	Sham. & Kitt	2:00-6:00	32	4	15	13	41%	1313	616	45%	E. STEVENS
THURS	2-4-82	71	WART. DET. MAC.	6:00-2:00	60	1	27	30	65%	2885	182	31%	S. P. LOCKE
FRI	2-5-82	72	Sham. & Kitt	6:30-10:00	46	7	3	36	78%	2180	1328	61%	L. J. SMITH
FRI	2-5-82	72	Sham. & Kitt	2:00-6:00	54	7	19	28	52%	2429	1812	73%	L. J. SMITH
FRI	2-5-82	57, 58, 18	Sham. & Kitt	6:30-10:00	58	20	2	36	62%	2722	712	26%	M. DEAM
FRI	2-5-82	34, 57	L. Shure & P. Mac	2:00-6:00	48	5	10	33	69%	2317	1547	65%	M. DEAM
FRI	2-5-82	61, 1-2	L. Shure & P. Mac	6:30-10:00	51	11	5	35	69%	2607	1511	58%	M. DEAM
FRI	2-5-82	61, 1-2	L. Shure & P. Mac	2:00-6:00	31	11	2	25	81%	1542	878	57%	M. DEAM
MON	2-1-82	61, 1-2	L. Shure & P. Mac	11:50-6:00	41	0	1	40	98%	2082	1527	64%	S. P. LOCKE
THURS	2-4-82	12, 34, 52	L. Shure & P. Mac	6:30-10:00	57	6	0	43	75%	2204	1722	61%	T. J. SMITH
THURS	2-4-82	56, 58	L. Shure & P. Mac	6:30-10:00	45	4	2	38	84%	2282	1661	70%	T. J. SMITH
THURS	2-4-82	61, 1-2	L. Shure & P. Mac	2:00-6:00	45	4	2	41	91%	2213	1682	74%	L. J. SMITH
FRI	2-5-82	40	Sham. & Kitt	6:30-10:00	61	10	7	54	89%	2112	815	30%	S. P. LOCKE
FRI	2-5-82	40	Sham. & Kitt	2:00-6:00	70	5	18	27	56%	3438	1123	31%	S. P. LOCKE
SUB-TOTAL					1544	213	263	1068	71%	74487	59447	53%	
HEN, RJS, NAG, LAR, LAB, DSL, HEW, WEH, CP, FILL													
(2) (12)													

REC'D
FEB 10
KIDSEAK
PLAN.

11/2/81

RECEIVED
FEB 7 1982
ALABAMA LUTHER TRAFFIC DISTRICT

11/2/81

#2

SUNDAY
PASSENGER CHECK

DATE MAR 14 1982

UN. NO. 4104 SCH. NO. 26

DRIVER

R. W. Seay

BADGE NO.

1111

UN. NO. 4108

DRIVER

J. L. S. S. S.

BADGE NO.

1200

UN. NO. 4103

DRIVER

C. E. Wood

BADGE NO.

1946

UN. NO. 4114

DRIVER

J. L. S. S. S.

BADGE NO.

1011

ROUTE	LEAVING TIME OF EACH TRIP.	TALLY OF BOARDING PASSENGERS EACH TRIP	TRIP TOTAL
13/A	4.50 A.M.	3-3-2354-2 - - - - -	22
40	6.33 A.M. 6.30 A.M.	23-4-3-5-6-4-3-2 - - - - -	35
40	7.53 A.M.	7-3-2-3-3-4-4-2-3-2-2-3-4-2-3 - - - - -	44
40B	9.07 A.M.	4-2-2-3-3-2-3-4-3-2-2-4-3-2-2-3 - - - - -	44
40	10.33 A.M.	2-2-2-4-4-10-9-9-5-7-2-6-5-5-13-5-7 - - - - -	120
40	12.07 P.M.	3-4-2-4-2-6-7-9-5-8-4-3	93
40	1.36 P.M.	6-7-5-3-4-2-2-1-1-5-2-12-1-3-1-1 7-10-9-11-1-1-1-1-2-1-2-1	175
40B	3.07 P.M.	1-7-1-5-1-2-1-1-2-2-1-1-3-1-1-3-1-1-1-4-1 1-3-2-1-1-4-3	55
40	4.31 P.M.	20-6-2-3-2-1-8-1-4-2-5-5-20-1-1-1-1-1-1 4-3-1-1-4-2-2-2-1-2-2-1-3-1-3-4-12	134
40	6.06 P.M.	6-1-1-1-1-1-2-7-2-4-4-2-2-2-2-2-9-2-2-1 2-4-2-10-2-1	94
40	7.44 P.M.	1-1-1-1-6-2-1-7-1-1-1-3-1-1-2-4-1-2-2-1-2-1-3-1-1 3-1-3-5-1	60
40	8.52 P.M.	2-1-1-3-1-1-2-3-2-3-2-1-2-4-1-1-1-1-2-2-1-3-2	42
40	10.16 P.M.	2-1-3-2-1-2-1-1-1-2-1-1-2-1-3-1-1-2-2-1	
40	11.15 P.M.	5-1-1-1-1-1-1-1-1-2-5-18-1-1-2-1-1-1	
40	12.38 P.M.	1-3-1-1-1-1-1-1-1-1	10
140K	1.46 A.M.	2-2-2-1-1	

PASSENGER COUNT

AT

OPERATOR
OPERATOR
OPERATOR

DATE 4/30 WEATHER 9:00 - SCHED. 7

COACH 147

TIME LEAVING:

DIRECTION: EAST bound

San Francisco Terminal

* Tunnel Exit (East End)

Toll Plaza

- *8th St. at Cypress (Via Nimitz)
- *MacArthur Freeway at Market St.

MacArthur Blvd. at Grand Avenue
MacArthur Blvd. at Lakeshore Avenue
Lakeshore Avenue at Boden Way
Lakeshore Avenue at Brooklyn Avenue
Lakeshore Avenue at Hanover Avenue
Lakeshore Avenue at E.18th Street
E.15th Street at 1st Avenue
E.15th Street at 5th Avenue
E.15th Street at 11th Avenue
E.14th Street at 15th Avenue
E.14th Street at 19th Avenue
E.14th Street at 23rd Avenue
E.14th Street at 29th Avenue
E.14th Street at Fruitvale Avenue
E.14th Street at 35th Avenue
E.14th Street at 36th Avenue
E.14th Street at High St.

- E. 14th at 51st Avenue
- E. 14th St. at Seminary Ave.
- E. 14th at Seminary Ave.
- E. 14th at Havenscourt
- E. 14th at 73rd Ave.
- E. 14th at 82nd Avenue
- E. 14th at 85th Avenue
- E. 14th at 90th Avenue
- E. 14th at 94th Avenue
- E. 14th at 98th Avenue
- E. 14th at 105th Avenue
- E. 14th at Bristol (SR Only)
- E. 14th at Broadmoor Blvd.
- E. 14th at Best Ave.
- E. 14th at Estudillo Ave.

- E. 14th at Parrott St.
- E. 14th at Castro Street
- E. 14th at Blossom Way
- E. 14th at San Leandro St.
- E. 14th at 143rd Avenue
- E. 14th at 148th Avenue
- E. 14th at 150th Avenue
- E. 14th at Bay Fair Shop.
- E. 14th at Thrush Avenue
- E. 14th at Ashland Ave.
- E. 14th St. at 163rd Ave.
- E. 14th St. at 164th Ave.
- E. 14th at Elgin Street
- E. 14th at 170th Ave.
- Mission at Lewelling Blvd
- Mission at Hampton
- Mission at Cherry Way
- Mission at Blossom Way
- Mission at Grove Way
- Mission at Sunset Blvd.
- Mission at Grace St.

PASSENGERS:

ON OFF

1050 PM

PASSINGERS

ON OF

1 ADDITIONAL:

ON OF

SEE PAGE 4

SEE PAGE 4

SEE PAGE 2

BART Passenger Counts

(1A)

PROCESS DATE 04/06/82

REFCPI DATE 04/05/82

SAN FRANCISCO BAY AREA RAPID TRANSIT

STATION OF ORIGIN DATA SUMMARY

	LINE --->						---< LINE					
	(LM)	(CL)	(EF)	(SF)	(FM)	(12)	(NA)	*SLE**	(CF)	(VC)	(CN)	(
	(FV)	(SL)	(F)	(LC)	*SLE**	(19)	(CA)	(FR)	(LF)	(FH)	*SLE**	
- LM)	4	88	201	88	141	32	14	104*	4	11	12	
	46	108	156	88	920*	44	14	6	5	10	48*	
FV)	65	106	224	113	144	254	58	616*	12	29	63	
	19	158	263	76	1168*	255	45	23	5	20	156*	
CL)	84	8	174	69	122	294	75	636*	13	36	63	
	107	64	183	83	894*	213	56	16	6	20	156*	
SL)	118	66	165	79	106	234	80	655*	5	10	21	
	168	15	226	89	1034*	216	25	10	5	14	65*	
EF)	202	167	25	111	223	247	45	688*	2	8	16	
	225	162	185	91	1355*	263	29	13	6	8	53*	
H)	177	207	197	109	373	257	71	660*	13	17	34	
	284	232	30	235	1844*	295	37	34	8	20	126*	
SF)	54	67	91	5	146	116	34	363*	1	3	7	
	54	87	124	74	786*	189	24	10	2		23*	
LC)	106	82	91	123	153	147	38	443*	5	4	5	
	89	53	233	15	1025*	221	37	2	1	8	25*	
FM)	135	130	221	226	73	190	66	539*	14	15	31	
	137	145	356	211	1678*	253	30	11	3	5	87*	
SLE	585	921	1389	927	1523	1771	485	4706*	65	137	252	
	1165	1064	1800	962	10744*	2145	301	125	47	105	735*	
12)	42	305	261	147	229	30	112	256*	65	164	309	
	210	256	264	183	1657*	45	67	50	52	140	864*	
19)	36	162	314	201	256	70	75	192*	127	267	435	
	175	287	277	199	1907*	20	23	82	175	285	1383*	
NA)	15	64	49	30	83	81	8	181*	37	66	133	
	58	50	77	31	461*	73	15	18	30	51	335*	
LK)	10	54	26	22	29	42	26	105*	5	8	33	
	58	18	39	33	285*	33	4	5	4	12	71*	
SLE	107	585	650	400	597	223	225	736*	242	505	914	
	501	611	657	446	4554*	175	113	155	305	452	2653*	
FF)	12	27	9	5	9	66	15	207*	100	165	100	
	16	11	25	3	1214	58	8	12	56	122	625*	

I.A.

ALCOHOLIC TRANSIT DISTRICT

REPORT NO 710003
PAGE 67

DATA SUMMARY

LINE -->						LINE -->					
(V0)	(CN)	(A)	(BE)	(EN)	45UL4	(AT)	(CC)	(24)	(LF)	45UL	
(FF)	45LE4	(ER)	(EF)	(FM)	(EM)	(FL)	(1E)	(CF)	(DC)	44CFAN	
11	12	28	53	31	266*	252	158	23	10	1002	
10	48*	111	20	23	214	250	20	7	28	2340	
29	63	49	40	48	488*	550	263	64	25	1982	
20	156*	241	27	63	404	436	70	19	51	4410	
36	63	60	35	70	391*	263	224	35	28	1007	
20	156*	114	27	65	200	181	31	10	29	2086	
10	21	28	13	39	267*	347	162	32	9	1191	
14	65*	139	22	26	308	272	31	8	22	3212	
8	16	31	14	13	252*	670	290	20	10	2122	
8	53*	162	18	10	624	436	29	10	25	4510	
17	34	66	51	82	488*	451	228	27	14	1514	
20	126*	211	36	42	388	324	46	13	23	4632	
3	7	11	9	11	157*	385	141	25	6	1170	
	23*	101	9	16	360	201	36	6	10	2455	
4	5	10	10	19	181*	530	210	35	16	1748	
8	25*	108	8	20	546	323	44	5	35	3422	
19	31	34	27	45	356*	656	322	42	21	2484	
5	87*	196	21	33	761	576	38	26	42	5144	
137	252	323	252	358	2846*	4144	2098	303	139	14220	
109	735*	1383	186	344	3805	3001	345	120	265	33255	
164	309	119	143	253	1338*	657	579	109	70	2530	
140	864*	427	166	230	491	764	105	25	120	7287	
267	439	112	185	428	1613*	607	360	80	44	2141	
289	1383*	436	240	212	416	420	65	40	109	7236	
66	133	28	41	85	489*	483	320	55	32	1845	
51	335*	173	43	119	332	327	50	15	31	3111	
8	33	12	11	17	85*	531	344	23	20	2561	
12	71*	20	4	21	867	308	25	12	31	3111	
509	914	271	380	783	3525*	2678	1603	267	166	9277	
452	2653*	1056	453	582	2106	1819	245	102	251	20745	
165	130	2	9	13	72*	680	313	33	11	2020	
122	625*	24	19	5	512	403	33	18	17	3045	

OPERATING DAY 4/05/82
PROCESS DATE 4/05/82

SAN FRANCISCO BAY AREA RAPID TRANSIT

(I.b)

OPERATING DAY 04/05/82 - MONDAY
PROCESS DATE 04/05/82

SAN FRANCISCO BAY AREA RAPID TRANSIT
SYSTEM PASSENGER FLOWS

		EASTWAY	WESTWAY
DAILY A I L Y F A S S E N G E R T R I P S	0700 - 0900 AM PEAK 04/05/82	11,037	11,002
	DAYTIME OFF PEAK 04/05/82	21,558	16,213
	0426 - 0626 PM PEAK 04/05/82	11,822	11,555
	EVENING OFF PEAK 04/05/82	5,487	3,633
	TOTAL DAY 04/05/82	50,904	42,403
DAILY PASSENGER MILES 04/05/82		573,891	223,664
AVERAGE TRIP LENGTH 04/05/82		11.34 7.42 SD	5.23 3.05
DAILY EXTRACTED FARES 04/05/82		41,552.15	28,212.10
AVERAGE EXTRACTED FARE 04/05/82		0.821 0.320 SD	0.655 0.194

ARLA RAPID TRANSIT DISTRICT
PASSENGER REPORT

REPORT NO. 13501

WESTEAY	TRANSEAY	TOTAL
11,002	25,168	47,207
16,213	32,633	70,704
11,955	26,245	50,026
3,633	12,551	22,111
42,803	56,641	150,048
223,664	1,758,835	2,556,350
8.23 3.05 SD	18.20 7.76 SD	13.45 8.68 SD
22,212.10	129,310.45	155,074.70
.655 0.194 SD	1.338 0.265 SD	1.047 0.402 SD

OPERATING DAY 04/05/82 - MONDAY
 PROCESS DATE 04/06/82

11C.

SAN FRANCISCO BAY AREA RAPID TRANSIT

HOURLY PASSENGER BEHAVIOR

CENTRAL OAKLAND - E STAT

FOLDS	04/05/82	
	ENTRIES	EXITS
0500 - 0559	62	58
0600 - 0659	757	1,016
0700 - 0759	3,171	3,258
0800 - 0859	2,916	2,996
0900 - 0959	892	1,108
1000 - 1059	562	849
1100 - 1159	610	911
1200 - 1259	440	537
1300 - 1359	647	1,060
1400 - 1459	688	1,154
1500 - 1559	738	1,337
1600 - 1659	892	2,241
1700 - 1759	898	2,950
1800 - 1859	265	1,187
1900 - 1959	118	553
2000 - 2059	51	366
2100 - 2159	56	355
2200 - 2259	46	257
2300 - 2359	37	232
0000 - 0059	21	135
0100 - 0140	0	1
TOTAL	13,971	23,065

#1d

REPRESENTATIVE PM PEAK WEEKDAY LOAD FACTORS FOR OCTOBER-DECEMBER 1981

TRANSBAY FROM EMBARCADERO

PERIOD/ROUTE TIME INTERVAL		TRAINS	CARS	SEATS	PASSENGERS	LOAD FACTOR
PEAK HOUR:						
• C/DC (1630-1729)	S*	7.0	70.0	5,040		
	A*	7.0	69.4	4,997	7,411	1.48
	Σ	100.0	99.1	99.1		
• F/DC (1630-1729)	S	5.0	50.0	3,600		
	A	4.7	46.9	3,377	5,009	1.48
	Σ	94.0	93.8	93.8		
• R/DC (1630-1729)	S	4.0	24.0	1,728		
	A	3.9	21.4	1,541	1,952	1.27
	Σ	97.5	89.2	89.2		
• TOTAL TRANSBAY (1630-1729)	S	16.0	144.0	10,368		
	A	15.6	137.7	9,914	14,372	1.45
	Σ	97.5	95.6	95.6		
BALANCE OF PEAK TRAIN CYCLE						
• C/DC (1545-1629) (1730-1812)	S	6.0	58.0	4,176		
	A	6.0	58.0	4,176	5,491	1.31
	Σ	100.0	100.0	100.0		
• F/DC (1545-1629) (1730-1812)	S	5.0	37.0	2,664		
	A	5.1	38.7	2,786	3,173	1.14
	Σ	102.0	104.6	104.6		
• R/DC (1545-1629) (1730-1812)	S	6.0	28.0	2,016		
	A	5.7	25.1	1,807	2,131	1.18
	Σ	95.0	89.6	89.6		
• TOTAL TRANSBAY (1545-1629) (1730-1812)	S	17.0	123.0	8,856		
	A	16.8	121.8	8,769	10,795	1.23
	Σ	98.8	99.0	99.0		
TOTAL PEAK PERIOD TRAIN CYCLE						
• C/DC (1545-1812)	S	13.0	128.0	9,216		
	A	13.0	127.4	9,173	12,902	1.41
	Σ	100.0	99.5	99.5		
• F/DC (1545-1812)	S	10.0	87.0	6,264		
	A	9.8	85.6	6,163	8,182	1.33
	Σ	98.0	98.4	98.4		
• R/DC (1545-1812)	S	10.0	52.0	3,744		
	A	9.6	46.5	3,348	4,083	1.22
	Σ	96.0	89.4	89.4		
• TOTAL TRANSBAY (1545-1812)	S	33.0	267.0	19,224		
	A	32.4	259.5	18,683	25,167	1.35
	Σ	98.2	97.2	97.2		

WESTBOUND FROM CIVIC CENTER

PERIOD/ROUTE TIME INTERVAL		TRAINS	CARS	SEATS	PASSENGER	LOAD FACTOR
PEAK HOUR:						
• F/DC (1630-1729)	S	12.0	96.0	6,912		
	A	11.7	90.6	6,523	6,558	1.01
	Σ	97.5	94.4	94.4		
BALANCE OF PEAK TRAIN CYCLE:						
(1545-1629)	S	17.0	146.0	10,512		
(1730-1812)	A	19.1	147.4	10,613	5,280	0.50
	Σ	95.5	101.0	101.0		
TOTAL PEAK PERIOD TRAIN CYCLE:						
(1545-1812)	S	31.0	242.0	17,424		
	A	30.8	238.0	17,136	11,838	0.69
	Σ	97.4	98.3	98.3		

NORTH AND EASTBOUND FROM MACARTHUR

PERIOD/ROUTE TIME INTERVAL		TRAINS	CARS	SEATS	PASSENGERS	LOAD FACTOR
PEAK HOUR:						
• C/DC (1647-1746)	S	7.0	70.0	5,040		
	A	7.0	69.4	4,997	7,148	1.43
	Σ	100.0	99.1	99.1		
• R/DC (1647-1746)	S	4.0	24.0	1,728		
	A	4.0	21.3	1,534	1,797	1.17
	Σ	100.0	88.7	88.7		
• F/R (1631-1730)	S	5.0	20.0	1,440		
	A	4.6	17.9	1,289	1,069	0.83
	Σ	92.0	89.5	89.5		
BALANCE OF PEAK TRAIN CYCLE						
• C/DC (1602-1546) (1747-1829)	S	6.0	58.0	4,176		
	A	5.9	56.4	4,061	5,309	1.31
	Σ	98.3	97.2	97.2		
• R/DC (1602-1546) (1747-1829)	S	6.0	28.0	2,016		
	A	5.6	24.9	1,793	1,633	0.91
	Σ	93.3	88.9	88.9		
• F/R (1546-1630) (1731-1814)	S	5.0	17.0	1,224		
	A	5.9	21.9	1,577	992	0.63
	Σ	118.0	128.8	128.8		
TOTAL PEAK PERIOD TRAIN CYCLE						
• C/DC (1602-1829)	S	13.0	128.0	9,216		
	A	12.9	125.8	9,058	12,457	1.38
	Σ	99.2	98.3	98.3		
• R/DC (1602-1829)	S	10.0	52.0	3,744		
	A	9.6	46.2	3,326	3,430	1.03
	Σ	96.0	88.8	88.8		
• F/R (1546-1814)	S	10.0	37.0	2,664		
	A	10.5	39.8	2,866	2,061	0.72
	Σ	105.0	107.6	107.6		

SOUTHBOUND FROM LAKE MERRITT

PERIOD/ROUTE TIME INTERVAL		TRAINS	CARS	SEATS	PASSENGERS	LOAD FACTOR
PEAK HOUR:						
• F/DC (1643-1742)	S	5.0	50.0	3,600		
	A	4.9	48.3	3,478	4,797	1.38
	Σ	98.0	96.6	96.6		
• F/R (1633-1732)	S	5.0	26.0	1,872		
	A	4.1	21.9	1,577	1,822	1.16
	Σ	82.0	84.2	84.2		
BALANCE OF PEAK TRAIN CYCLE:						
• F/DC (1558-1642) (1743-1825)	S	5.0	37.0	2,664		
	A	5.3	39.0	2,808	2,949	1.05
	Σ	106.0	105.4	105.4		
• F/R (1547-1632) (1733-1816)	S	5.0	19.0	1,368		
	A	5.3	21.1	1,519	1,420	0.93
	Σ	106.0	111.1	111.1		
TOTAL PEAK PERIOD TRAIN CYCLE:						
• F/DC (1558-1825)	S	10.0	87.0	6,264		
	A	10.2	87.3	6,286	7,746	1.23
	Σ	102.0	100.3	100.3		
• F/R (1547-1816)	S	10.0	45.0	3,240		
	A	9.4	43.0	3,096	3,242	1.05
	Σ	94.0	95.6	95.6		

*S- Scheduled service

A- Actual service provided

Σ= (Actual/Scheduled) x 100. Exact percentages may differ slightly due to rounding.

1978 AC Transit On-Board Survey

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THESE QUESTIONS CONCERN THE RIDE YOU ARE NOW TAKING.

23	26	29	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138	141	144	147	150	153	156	159	162	165	168	171	174	177	180	183	186	189	192	195	198	201	204	207	210	213	216	219	222	225	228	231	234	237	240	243	246	249	252	255	258	261	264	267	270	273	276	279	282	285	288	291	294	297	300	303	306	309	312	315	318	321	324	327	330	333	336	339	342	345	348	351	354	357	360	363	366	369	372	375	378	381	384	387	390	393	396	399	402	405	408	411	414	417	420	423	426	429	432	435	438	441	444	447	450	453	456	459	462	465	468	471	474	477	480	483	486	489	492	495	498	501	504	507	510	513	516	519	522	525	528	531	534	537	540	543	546	549	552	555	558	561	564	567	570	573	576	579	582	585	588	591	594	597	600	603	606	609	612	615	618	621	624	627	630	633	636	639	642	645	648	651	654	657	660	663	666	669	672	675	678	681	684	687	690	693	696	699	702	705	708	711	714	717	720	723	726	729	732	735	738	741	744	747	750	753	756	759	762	765	768	771	774	777	780	783	786	789	792	795	798	801	804	807	810	813	816	819	822	825	828	831	834	837	840	843	846	849	852	855	858	861	864	867	870	873	876	879	882	885	888	891	894	897	900	903	906	909	912	915	918	921	924	927	930	933	936	939	942	945	948	951	954	957	960	963	966	969	972	975	978	981	984	987	990	993	996	999	1002	1005	1008	1011	1014	1017	1020	1023	1026	1029	1032	1035	1038	1041	1044	1047	1050	1053	1056	1059	1062	1065	1068	1071	1074	1077	1080	1083	1086	1089	1092	1095	1098	1101	1104	1107	1110	1113	1116	1119	1122	1125	1128	1131	1134	1137	1140	1143	1146	1149	1152	1155	1158	1161	1164	1167	1170	1173	1176	1179	1182	1185	1188	1191	1194	1197	1200	1203	1206	1209	1212	1215	1218	1221	1224	1227	1230	1233	1236	1239	1242	1245	1248	1251	1254	1257	1260	1263	1266	1269	1272	1275	1278	1281	1284	1287	1290	1293	1296	1299	1302	1305	1308	1311	1314	1317	1320	1323	1326	1329	1332	1335	1338	1341	1344	1347	1350	1353	1356	1359	1362	1365	1368	1371	1374	1377	1380	1383	1386	1389	1392	1395	1398	1401	1404	1407	1410	1413	1416	1419	1422	1425	1428	1431	1434	1437	1440	1443	1446	1449	1452	1455	1458	1461	1464	1467	1470	1473	1476	1479	1482	1485	1488	1491	1494	1497	1500	
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8. HOW OFTEN DO YOU RIDE AC TRANSIT BUSES?

1 ☐ AT LEAST 4 DAYS A WEEK

3 ☐ 1-3 DAYS A MONTH

2 ☐ 1-3 DAYS A WEEK

4 ☐ LESS THAN ONE DAY A MONTH

9. WHAT IS OR WAS THE MAIN REASON FOR THIS TRIP?

1 ☐ WORK

4 ☐ MEDICAL, DENTAL

2 ☐ SCHOOL OR UNIVERSITY

5 ☐ PERSONAL BUSINESS

3 ☐ SHOPPING

6 ☐ SOCIAL, RECREATION

7 ☐ OTHER _____

10. DO YOU HAVE A HANDICAP DISCOUNT CARD? 1 ☐ YES 2 ☐ NO

11. WAS A CAR AVAILABLE TO YOU TO MAKE THIS TRIP TODAY?

1 ☐ YES 2 ☐ NO

12. SEX: 1 ☐ MALE 2 ☐ FEMALE

13. AGE: 1 ☐ UNDER 5 3 ☐ 13-17 5 ☐ 30-59 7 ☐ 65 AND OVER

2 ☐ 5-12

4 ☐ 18-30

6 ☐ 60-64

14. HOUSEHOLD INCOME:

1 ☐ UNDER \$7,000

3 ☐ \$15,001-\$25,000

2 ☐ \$7,001-\$15,000

4 ☐ \$25,001-\$35,000

5 ☐ OVER \$35,000

15. ETHNIC BACKGROUND:

1 ☐ ASIAN

4 ☐ AMERICAN INDIAN

2 ☐ BLACK

5 ☐ WHITE

3 ☐ MEXICAN OR
HISPANIC

6 ☐ OTHER _____

COMMENTS: _____

PLEASE RETURN THIS FORM TO SURVEY TAKER. THANK YOU FOR YOUR COOPERATION.

THIS INFORMATION IS CONFIDENTIAL AND FOR STATISTICAL PURPOSES ONLY.

BART Passenger Profile Survey

BART PASSENGER SURVEY QUESTIONNAIRE—1980



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street
Oakland, California 94607
Telephone 465-4100

Nº 20156

Good Day!

Please help us to plan better transportation service at BART by answering a few questions about yourself and the rail trip you are now making. Your responses will be treated anonymously and will be used only for gathering and analyzing statistics.

COMPLETE AS MUCH OF THIS QUESTIONNAIRE AS YOU CAN DURING YOUR RAIL TRIP ON BART AND DEPOSIT THIS FORM AT THE EXIT GATE WHEN YOU LEAVE THE SYSTEM. CHECK THE APPROPRIATE BOX TO ANSWER QUESTIONS, OR FILL IN THE APPROPRIATE BLANKS.

- ☐ Yes Please indicate if you answered a questionnaire like this one earlier today. Either way, please proceed with this one.
☐ No Thank you

ORIGIN

1. For this rail trip, which BART station did you enter at, and at what time?

Entry Station _____ Time _____ AM _____ PM

2. Just before arriving at the BART station indicated above, what location did you start out from? If you came from a house, a hotel, or a place of work, where is it located? If you were on a shopping trip, what is the location of the last store you were at?

Nearest Cross Streets, Well Known Place or Street Address.
Examples: 12th & Oak Sts., Union Square, 100 Main St.

City _____ Zip Code (if you know it) _____

3. Is this starting location your home? ☐ Yes ☐ No

4. How did you travel to the station where you got on BART? Please check only the most important one.

- ☐ Drove Alone in Car, Truck, or Van ☐ Streetcar
☐ Drove or Rode with Others and Parked ☐ Used Motorcycle or Moped
☐ (No. in Vehicle) _____ ☐ Walked
☐ Dropped Off by Car ☐ Bicycled
☐ Bus ☐ Other _____
Please specify _____

5. How many minutes did it take you to get from your starting location to the station at which you got on BART?

Minutes _____

DESTINATION

6. At which BART station will you exit for this rail trip? Please specify

Exit Station _____

7. What is the location of your immediate destination after leaving the BART station?

Nearest Cross Street, Well Known Place or Street Address.

City _____ Zip Code (if you know it) _____

8. How will you travel from the BART station to your next location? Please check only the most important one.

- ☐ Drive Alone in Car, Truck, or Van ☐ Streetcar
☐ Drive or Ride with Others ☐ By Motorcycle or Moped
☐ To Be Picked Up by Car ☐ Walk
☐ Bus ☐ Bicycle
☐ Other _____
Please specify _____

9. Approximately how many minutes will it take you to get from the BART station to that destination?

TRIP PURPOSE

10. The major purpose of this rail trip is to go to or from: (Check only one)

- ☐ Work/Work Related Business
☐ School or College
☐ Shopping Place Area
☐ A Visit with Friends or Relatives
☐ A Place to Transact Personal Business
☐ Medical/Dental Office, Clinic, or Hospital
☐ Athletic Event, Entertainment, Dining Out
☐ A Recreation Facility (Examples: Park, Beach)
☐ Sightseeing
☐ Riding BART

☐ Other _____ Please specify _____

11. What is the color of the BART ticket you use?
☐ Blue ☐ Red ☐ Green

12. How frequently do you usually use BART on weekdays (Monday-Friday) for any purpose?

- ☐ Every Weekday (Monday-Friday)
☐ 3-4 Days Each Week
☐ 1-2 Days Each Week
☐ Less Than Once Each Week
☐ Less Than Once Each Month
☐ Don't Usually Use BART

13. If riding less than once a week, why don't you use BART more often?

Please indicate _____

14. Was a car, truck, or van available to you for today's trip?
☐ Yes ☐ No

15. If yes, why didn't you use it for today's trip?

Please indicate _____

16. What type of transportation would you use today for this type of trip if BART were unavailable? Check the one you would use most often.

- ☐ Drive Alone in Car, Truck, or Van
☐ Drive or Ride with Others
☐ Bus
☐ Streetcar
☐ Motorcycle or Moped
☐ Walk
☐ Bicycle
☐ Wouldn't Make Trip

☐ Other _____ Please specify _____

17. Will your use of BART today be:

- ☐ Only One Way
☐ Round Trip (Using BART for both directions)

18. Have you just started riding BART since May of last year?
☐ Yes ☐ No

19. If yes, why did you start?

Please indicate _____

2
Card**WORKING HOURS (Commuters Only)**

20. If you use BART to commute to work, please tell us whether or not your working hours are *fixed* or *flexible*, as follows:
- ☐ Fixed I have to arrive at work punctually at a fixed time each day.
- ☐ Flexible I can vary the time I start work from day to day.
- ☐ Combination I can vary my starting time at work but only with prior approval.
21. If your working hours are *fixed*, how much earlier than the official start time do you usually arrive at work?
- ☐ Less than 5 Minutes Early
- ☐ 5 - 10 Minutes Early
- ☐ 11 - 15 Minutes Early
- ☐ 16 - 30 Minutes Early
- ☐ Over 30 Minutes Early
22. If your working hours are *flexible*, by how much time are you allowed to vary your starting time from day to day?
- ☐ Less than 15 Minutes
- ☐ 15 - 30 Minutes
- ☐ 31 - 60 Minutes
- ☐ Over 60 Minutes
- ☐ Only with Approval
23. My usual starting time at work and leaving time from work for this month have been as follows:
- | Starting Time | Leaving Time |
|---|--|
| ☐ Before 7:00 A.M. | ☐ Before 4:00 P.M. |
| ☐ 7:01 A.M. - 7:30 A.M. | ☐ 4:01 P.M. - 4:30 P.M. |
| ☐ 7:31 A.M. - 7:45 A.M. | ☐ 4:31 P.M. - 4:45 P.M. |
| ☐ 7:46 A.M. - 8:00 A.M. | ☐ 4:46 P.M. - 5:00 P.M. |
| ☐ 8:01 A.M. - 8:15 A.M. | ☐ 5:01 P.M. - 5:15 P.M. |
| ☐ 8:16 A.M. - 8:30 A.M. | ☐ 5:16 P.M. - 5:30 P.M. |
| ☐ 8:31 A.M. - 9:00 A.M. | ☐ 5:31 P.M. - 6:00 P.M. |
| ☐ 9:01 A.M. - 10:00 A.M. | ☐ 6:01 P.M. - 7:00 P.M. |
| ☐ Other Specific Time | ☐ Other Specific Time |
| ☐ Varies Considerably | ☐ Varies Considerably |

WEEKEND SERVICE

24. How frequently do you ride BART on weekends?
- | Saturdays | Sundays |
|--|--|
| ☐ Every Saturday | ☐ Every Sunday |
| ☐ About Two Saturdays a Month | ☐ About Two Sundays a Month |
| ☐ One Saturday a Month | ☐ One Sunday a Month |
| ☐ Once Every Two Months | ☐ Once Every Two Months |
| ☐ 2-4 Saturdays a Year | ☐ 2-4 Sundays a Year |
| ☐ Once a Year or Less | ☐ Once a Year or Less |
| ☐ Never | ☐ Never |
25. The major purpose of my use of BART on weekends is as follows. Please check each side below. One box only for Saturdays, and one box only for Sundays.
- | Saturdays | Sundays |
|--|--------------------------|
| ☐ Work/Work Related Business | ☐ |
| ☐ Shopping Place Area | ☐ |
| ☐ A Visit with Friends or Relatives | ☐ |
| ☐ Personal Business or Medical | ☐ |
| ☐ Recreation or Entertainment | ☐ |
| ☐ Sightseeing or Riding BART | ☐ |
| ☐ Other | ☐ |
- Please specify

BART SECURITY

26. "BART is doing a good job of providing police protection." Do you agree or disagree with this statement?
- ☐ Strongly Agree
- ☐ Agree Somewhat
- ☐ Neither Agree Nor Disagree
- ☐ Disagree Somewhat
- ☐ Strongly Disagree

VITAL STATISTICS

And finally, we would like to know something about you. This information will be used to compare BART riders with the general population.

27. What is your sex? ☐ Male ☐ Female
28. What is your age?
- | | |
|-----------------------------------|----------------------------------|
| ☐ Under 18 | ☐ 45-49 |
| ☐ 18-24 | ☐ 50-54 |
| ☐ 25-34 | ☐ 55-64 |
| ☐ 35-44 | ☐ Over 65 |
29. How much school have you completed? Check only one
- ☐ Less than High School Graduate
- ☐ Graduated from High School
- ☐ Some College Jr. College
- ☐ Four Year College Graduate
- ☐ More than Four Years College
30. Which category describes you the closest?
- ☐ Black
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Other Asian
- ☐ Mexican-American (Chicano, Mexican)
- ☐ Other Spanish Hispanic
- ☐ Native American (Incl. Eskimo, Aleut.)
- ☐ White
- ☐ Other
- Please specify
31. Are you a:
- ☐ Senior Citizen and/or
- ☐ Handicapped Person
- ☐ Neither
32. What is your occupation?
- ☐ Management Professional
- ☐ Clerical Sales
- ☐ Technical
- ☐ Skilled Unskilled Labor
- ☐ Service Industry
- ☐ Student Retired
- ☐ Homemaker
- ☐ Other
- Please specify
33. What is the approximate range of your household's income last year, before taxes?
- | | |
|--|--|
| ☐ Under \$7,000 | ☐ \$25,000 - \$29,999 |
| ☐ \$7,000 - \$9,999 | ☐ \$30,000 - \$34,999 |
| ☐ \$10,000 - \$14,999 | ☐ \$35,000 - \$39,999 |
| ☐ \$15,000 - \$19,999 | ☐ \$40,000 - \$44,999 |
| ☐ \$20,000 - \$24,999 | ☐ \$50,000 or more |

PLEASE GIVE US YOUR COMMENTS, CRITICISMS, OR SUGGESTIONS ABOUT THIS QUESTIONNAIRE OR BART.

BART PASSENGER SURVEY QUESTIONNAIRE—1982



BAY AREA RAPID TRANSIT DISTRICT

800 Madison Street
Oakland, California 94607
Telephone 465-4100

Nº 13618

(6-10)

Good Day!

Please help us to plan better transportation service at BART by answering a few questions about yourself and the rail trip you are now making. Your responses will be treated anonymously and will be used only for gathering and analyzing statistics.

COMPLETE AS MUCH OF THIS QUESTIONNAIRE AS YOU CAN DURING YOUR RAIL TRIP ON BART AND DEPOSIT THIS FORM AT THE EXIT GATE WHEN YOU LEAVE THE SYSTEM. CHECK THE APPROPRIATE BOX TO ANSWER QUESTIONS, OR FILL IN THE APPROPRIATE BLANKS.

ORIGIN

1. For this rail trip, at which BART station did you enter, and at what time? Please specify.

Entry Station _____ Time _____ AM _____ PM

2. Just before arriving at the BART station indicated above, what location did you start out from? If you came from a house, a hotel, or a place of work, where is it located? If you were on a shopping trip, what is the location of the last store you were at?

Nearest Cross Streets or Well Known Place
Example: 12th & Oak Sts., Union Square

City _____ Zip Code (if known) _____

3. Is this starting location your home? 1 ☐ Yes 2 ☐ No

4. How did you travel to the station where you got on BART? Please check only the most important one.

- 1 ☐ Drove Alone or with One Other Person in Car, Truck or Van
2 ☐ Drove or Rode with Two or More Other People and Parked (Car Pool)
3 ☐ Dropped Off by Car
4 ☐ Bus: Route # _____
5 ☐ Streetcar
6 ☐ Used Motorcycle or Moped
7 ☐ Walked
8 ☐ Bicycled
9 ☐ Other _____

5. How many minutes did it take you to get from your starting location to the station at which you got on BART?

Minutes _____

PARKING

6. If you used a car, truck, or van to travel to BART:

- A. Was parking a problem? 1 ☐ Yes 2 ☐ No
B. Would you be willing to pay for parking at your home BART station if that guaranteed you a parking space?

How Much?

- 1 ☐ Yes 2 ☐ No
1 ☐ Up to \$.50 per day
2 ☐ Up to \$1.00 per day
3 ☐ Up to \$1.50 per day
4 ☐ More than \$1.50 per day

- C. Were you aware that BART offers close-in reserved parking at certain stations for car pools of three or more people (BARTPOOL) 1 ☐ Yes 2 ☐ No

- D. Would you use feeder bus service instead if it were made available to you? 1 ☐ Yes 2 ☐ No

- E. Do you know of anyone who does not now use BART because:

Yes No

- Parking is a problem? ☐ ☐
• Car pooling is not possible? ☐ ☐
• Feeder bus service is not available? ☐ ☐

DESTINATION

7. At which BART station will you exit for this rail trip? _____ Exit Station

8. What is the location of your immediate destination after leaving the BART station?

Nearest Cross Street or Well Known Place _____

City _____ Zip Code (if known) _____

9. How will you travel from the BART station to your next location? Please check only the most important one.

- 1 ☐ Drive Alone or with One Other Person in Car, Truck or Van
2 ☐ Drive or Ride with Two or More Other People
3 ☐ To Be Picked Up by a Car
4 ☐ Bus: Route # _____
5 ☐ Streetcar
6 ☐ By Motorcycle or Moped
7 ☐ Walk
8 ☐ Bicycle
9 ☐ Other _____

10. Approximately how many minutes will it take you to get from the BART station to that destination?

Minutes _____

TRIP PURPOSE

11. The major purpose of this rail trip is to go to or from: Check only one.

- 1 ☐ Commute To/From Work
2 ☐ Work-related Business
3 ☐ School or College
4 ☐ Shopping Place/ Area
5 ☐ A Visit with Friends or Relatives
6 ☐ Personal Business or Medical/ Dental Office, etc.
7 ☐ Athletic Event, Entertainment, Dining Out, etc.
8 ☐ Sightseeing or Riding BART

12. If you use BART to commute to work, please tell us whether or not your working hours are fixed or flexible, as follows:

- 1 ☐ Fixed I have to arrive at work punctually at a fixed time each day.
2 ☐ Flexible I can vary the time I start work from day to day.
3 ☐ Combination I can vary my starting time at work but only with prior approval.

13. How frequently do you usually use BART on weekdays (Monday-Friday) for any purpose?

- 1 ☐ Every Weekday (Monday-Friday)
2 ☐ 3-4 Days Each Week
3 ☐ 1-2 Days Each Week
4 ☐ Less Than Once Each Week
5 ☐ Less Than Once Each Month
6 ☐ Don't Usually Use BART

14. If riding less than once a week, why don't you use BART more often?

- 1 ☐ Takes too Long, too Slow
2 ☐ Have other Means of Transportation
3 ☐ Doesn't Go Where I Want to Go
4 ☐ Car Needed for Errands, Business, etc.
5 ☐ Other _____
Please specify

OVER →

PLEASE COMPLETE BOTH SIDES OF THIS FORM

(#2)
(Cont'd)

ALTERNATIVE MODE

15. If you now use BART regularly (more than once each week), what type of transportation did you previously use most often?
- 1 ☐ Drove Alone or with One Other Person in Car, Truck or Van
2 ☐ Drove or Rode with Two or More Other People (Car Pool)
3 ☐ Bus: Route # _____
- 4 ☐ Streetcar
5 ☐ Motorcycle or Moped
6 ☐ Walk
7 ☐ Bicycle
8 ☐ Other _____
16. Was a car, truck, or van available to you for today's trip? 1 ☐ Yes 2 ☐ No
17. If Yes, why didn't you use it for today's trip? Check as appropriate.
- 1 ☐ Parking is difficult or expensive
2 ☐ Too much traffic
3 ☐ Operating vehicle is too expensive
4 ☐ BART is more convenient
5 ☐ BART is less expensive
6 ☐ BART is more reliable now
7 ☐ Other _____

Please specify

18. How many cars, trucks, or vans are there in your household?
- 1 ☐ One 3 ☐ Three 5 ☐ None
2 ☐ Two 4 ☐ Four or More
19. What type of transportation would you have used for today's trip if BART were unavailable? Check the one you would use most often.
- 1 ☐ Drive Alone or with One Other Person in Car, Truck or Van
2 ☐ Drive or Ride with Two or More Other People (Car Pool)
3 ☐ Bus: Route # _____
- 4 ☐ Streetcar
5 ☐ Motorcycle or Moped
6 ☐ Walk
7 ☐ Bicycle
8 ☐ Would Not Make Trip
9 ☐ Other _____

Please indicate

SYSTEM USE

20. Will your use of BART today be: Check only one.
- 1 ☐ Only One Way
2 ☐ Round Trip (Using BART for both directions)
3 ☐ More Frequently
21. Did you start riding BART since January 1981? 1 ☐ Yes 2 ☐ No
22. If yes, why did you start? Check as many boxes as applicable.
- 1 ☐ Parking is difficult or expensive
2 ☐ Too much traffic
3 ☐ Operating vehicle is too expensive
4 ☐ BART is more convenient
5 ☐ BART is less expensive
6 ☐ BART is more reliable now
7 ☐ Other _____

Please specify

23. If you have been riding BART since before January 1981, how has service been since then?
- 1 ☐ Much Better 4 ☐ Worse
2 ☐ Better 5 ☐ Much Worse
3 ☐ No Difference
24. How often do you use BART for mid-day and/or evening trips?
- Mid-day 9:00 AM-4:00 PM Evening 7:00 PM-Midnight
- 1 ☐ Every Weekday (Mon-Fri) 1 ☐
2 ☐ 3-4 Days Each Week 2 ☐
3 ☐ 1-2 Days Each Week 3 ☐
4 ☐ Less than Once Each Week 4 ☐
5 ☐ Less than Once Each Month 5 ☐
6 ☐ Don't Usually Use BART 6 ☐
for Such Trips

25. If you indicated that you use BART less frequently than once each week for mid-day and/or evening trips, how likely would you be to use BART more often during these times if a substantial discount were made available to you?

Mid-day

Evening

For What Discount?

- 1 ☐ Very likely 1 ☐ 20% Off
2 ☐ Somewhat likely 2 ☐ 30% Off
3 ☐ Not at all likely 3 ☐ 50% Off
4 ☐ More

TRANSFERS & PASSES

26. How frequently do you transfer between different public transit systems (such as between Muni and BART)?
- 1 ☐ Most of the time 2 ☐ Sometimes 3 ☐ Never
27. If you answered that you sometimes or never transfer between different public transit systems, how likely would you be to start transferring if a joint pass were made available to you?
- 1 ☐ Very likely 3 ☐ Not at all likely
2 ☐ Somewhat likely 4 ☐ Not applicable/ No need for transfer
28. Do you use a Bay Region Transit District Card for handicapped persons? 1 ☐ Yes 2 ☐ No
29. Would you buy higher value (over \$20) BART tickets if they were made available?
- How Much?
- 1 ☐ Yes 1 ☐ Up to \$25
2 ☐ No 2 ☐ Up to \$30
3 ☐ Up to \$40
4 ☐ More than \$40

VITAL STATISTICS

And finally, we would like to know something about you. This information will be used to compare BART riders with the general population.

30. What is your sex? 1 ☐ Male 2 ☐ Female
31. What is your age?
- 1 ☐ Under 18 5 ☐ 45-49
2 ☐ 18-24 6 ☐ 50-54
3 ☐ 25-34 7 ☐ 55-64
4 ☐ 35-44 8 ☐ 65 and Over
32. How much school have you completed? Check only one.
- 1 ☐ Less than High School Graduate
2 ☐ Graduated from High School
3 ☐ Some College/Jr. College
4 ☐ Four Year College Graduate
5 ☐ More than Four Years College
33. Which category describes you the closest?
- 1 ☐ Black 6 ☐ Mexican-American (Chicano, Mexican)
2 ☐ Chinese 7 ☐ Other Spanish/ Hispanic
3 ☐ Filipino 8 ☐ American Indian/ Eskimo
4 ☐ Japanese 9 ☐ White
5 ☐ Other Asian 0 ☐ Other _____

Please specify

34. What is your occupation?
- 1 ☐ Management/ Professional 5 ☐ Service Industry
2 ☐ Clerical/ Sales 6 ☐ Student/ Retired
3 ☐ Technical 7 ☐ Homemaker
4 ☐ Skilled/ Unskilled Labor 8 ☐ Other _____

Please indicate

35. What is the approximate range of your total household income last year, before taxes?
- 1 ☐ Under \$7,000 6 ☐ \$25,000-29,999
2 ☐ \$7,000-9,999 7 ☐ \$30,000-34,999
3 ☐ \$10,000-14,999 8 ☐ \$35,000-39,999
4 ☐ \$15,000-19,999 9 ☐ \$40,000-49,999
5 ☐ \$20,000-24,999 0 ☐ \$50,000 or more

PLEASE GIVE US YOUR COMMENTS, CRITICISMS, OR SUGGESTIONS ABOUT THIS QUESTIONNAIRE OR BART.

THANK YOU FOR YOUR ASSISTANCE. PLEASE DEPOSIT IN SPECIAL BOX AS YOU EXIT.

1981 BARTD Latent Demand/Public Awareness Survey

DECISION RESEARCH INSTITUTE
777 North First Street
Suite 660
San Jose, CA 95112
(408) 287-9738

1981 BART Latent Demand and
Public Awareness Survey
Survey #8103
Interview Start Time: _____
Interview End Time: _____
Census Tract _____

Hello, I'm _____ of Decision Research Institute.
We're doing a survey today on travel and transportation in the San Francisco
Bay Area.

INTERVIEW PERSONS 14 YEARS AND OLDER

THIS IS A CONFIDENTIAL DOCUMENT

1. Have you heard of BART (Bay Area Rapid Transit District)?

- 1. Yes 1
- 2. No 2
- 3. Undecided 3
- 4. DK/DTS 4

2. Have you used BART in the past year?

- | | | |
|-----------|---|--------------------|
| 1. Yes | 1 | SKIP TO QUESTION 5 |
| 2. No | 2 | ASK QUESTION 2A |
| 3. DK/DTS | 3 | ASK QUESTION 2A |

2A. Have you ever ridden on BART?

- | | | |
|-------------------------------|---|---------------------|
| 4. Yes, rode before past year | 4 | ASK QUESTION 3 |
| 5. Never used BART | 5 | SKIP TO QUESTION 6 |
| 6. DK/DTS | 6 | SKIP TO QUESTION 73 |

3. How frequently did you ride BART in the past?

- 1. 5 or more days per week 1
- 2. 3-4 days per week 2
- 3. 1-2 days per week 3
- 4. Less than once a week 4
- 5. Other 5
- 6. DK/DTS 6

OAKLAND CENTRAL DISTRICT
TRANSIT SYSTEM IMPROVEMENT STUDY
PHASE I

FINAL REPORT

Prepared for
CITY OF OAKLAND

June, 1982

by

DKS ASSOCIATES

in association with

Sedway/Cooke
J. Warren & Associates
Theresa Hughes & Associates

The preparation of this report has been financed through a grant from the U.S. Department of Transportation, Urban Mass Transportation Administration, under the Urban Mass Transportation Act of 1964, as amended. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

DKS Associates

Traffic • Transportation • Engineering

June 29, 1982

Mr. John Soderling
City Traffic Engineer
City of Oakland
1421 Washington Street
Oakland, California 94612

P81102-0

Subject: Central District Transit System Improvement Study -- Phase I

Dear Mr. Soderling:

On behalf of DKS Associates and our subcontractors, Sedway/Cooke, J. Warren & Associates and Theresa Hughes & Associates, we are pleased to submit the attached Final Report for the above referenced study. This Phase I Study identifies the nature and scale of key transit issues in Oakland's Central District, and proposes a thorough Phase II study program to respond to these issues.

Downtown Oakland is on the verge of a rapid growth cycle that could dramatically alter the downtown. Transit improvements will be needed in order to support this growth. The interdependency between land use and transportation dictates, however, that the transit study be performed as a part of a more comprehensive analysis of downtown land use, traffic, parking, and other facets of development. Hence, while the Phase II work program focuses on the transit component, it has been designed as an integral element of a comprehensive Central District Development Program.

We wish to express our appreciation to the City of Oakland for the opportunity to have served on this assignment. Our particular thanks go to Bond Yee and Dr. I. Jeeva of the Department of Public Works for their assistance during the study. We would also like to thank the members of the study's Technical Advisory Committee and Citizens Advisory Committee for their thoughtful inputs, review and guidance throughout the study.

Yours truly,

DKS ASSOCIATES



Hans W. Korve
President

HWK:MAK:ceh

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Chapter I

INTRODUCTION

An extraordinary amount of new office, retail and residential development is currently proposed for development within Oakland's Central District. These development proposals, when completed, will triple the level of activity in downtown Oakland and establish it as a major transit destination within the San Francisco Bay Area. The City of Oakland, concerned that adequate policies may not exist to react to this increased travel demand, has commissioned this first phase of a two-phase study to produce a comprehensive transit program to support the proposed Central District development.

There is a close relationship between land use and transportation in the downtown. Travel demands are generated by land use and, in turn, transit, traffic and parking facilities to meet these demands alter accessibility and therefore affect subsequent land use and development decisions. Accordingly, the transit study was originally conceived of as a component of a comprehensive Central District Development Program (CDDP). Although funding limitations dictated that this Phase I transit study be commissioned separately, it is clear that the subsequent Phase II transit study needs to be carried out in conjunction with the other CDDP elements.

STUDY OVERVIEW

Consistent with the magnitude of projected changes and the complex issues raised, the transit study program has been divided into two phases. The Phase I study, the findings and recommendations of which are presented herein, had these primary tasks:

- Identify the nature and dimensions of transit issues affecting the Central District.
- Assess data base needs for resolving the identified issues.
- Propose preliminary goals and objectives for Central District transit service.
- Develop a work program for the Phase II study which will develop responsive proposals for transit service, financing and policies.

The program and guidelines resulting from the Phase II study will be incorporated into the recommended CDDP and will be considered for inclusion in transportation improvement programs of the City of Oakland, AC Transit and BART.

THE STUDY AREA

The focus of this study is the Oakland Central District, boundaries of which are shown in Figure 1. This area is Oakland's primary business district, and contains much of the City's office space. Office uses are concentrated into two areas: City Center and the Kaiser Center area. The Central District also contains Oakland's Chinatown district and other residential and retail uses. The southern portion of the study area presently includes a produce wholesaling area and Jack London Square. The County administration complex is located on the eastern flank of the Central District. Major developments have recently been proposed for the Central District, primarily involving office uses. Largest among these are the Trans Pacific Centre, City Center and Kaiser Center.

The Central District is generally well served by the regional and local transportation systems. The regional highway and rail systems radiate from the downtown. The area is also at the center of the BART rail rapid transit system and a major hub for AC Transit eastbay bus service. Most of the existing downtown office buildings and retail areas are within convenient walking distance of a downtown BART station and/or AC Transit lines.

STUDY ORGANIZATION

The two-phase transit study is under the direction of a Project Steering Committee with representatives from the City of Oakland, BART, AC Transit, MTC and the Chamber of Commerce. The role of the Steering Committee is to set policy, make decisions about conduct of the study and approve study recommendations.

The City of Oakland contracted with AC Transit, the funding recipient, to conduct the Phase I study. The City of Oakland in turn subcontracted elements of the work to a consultant team headed by DKS Associates.

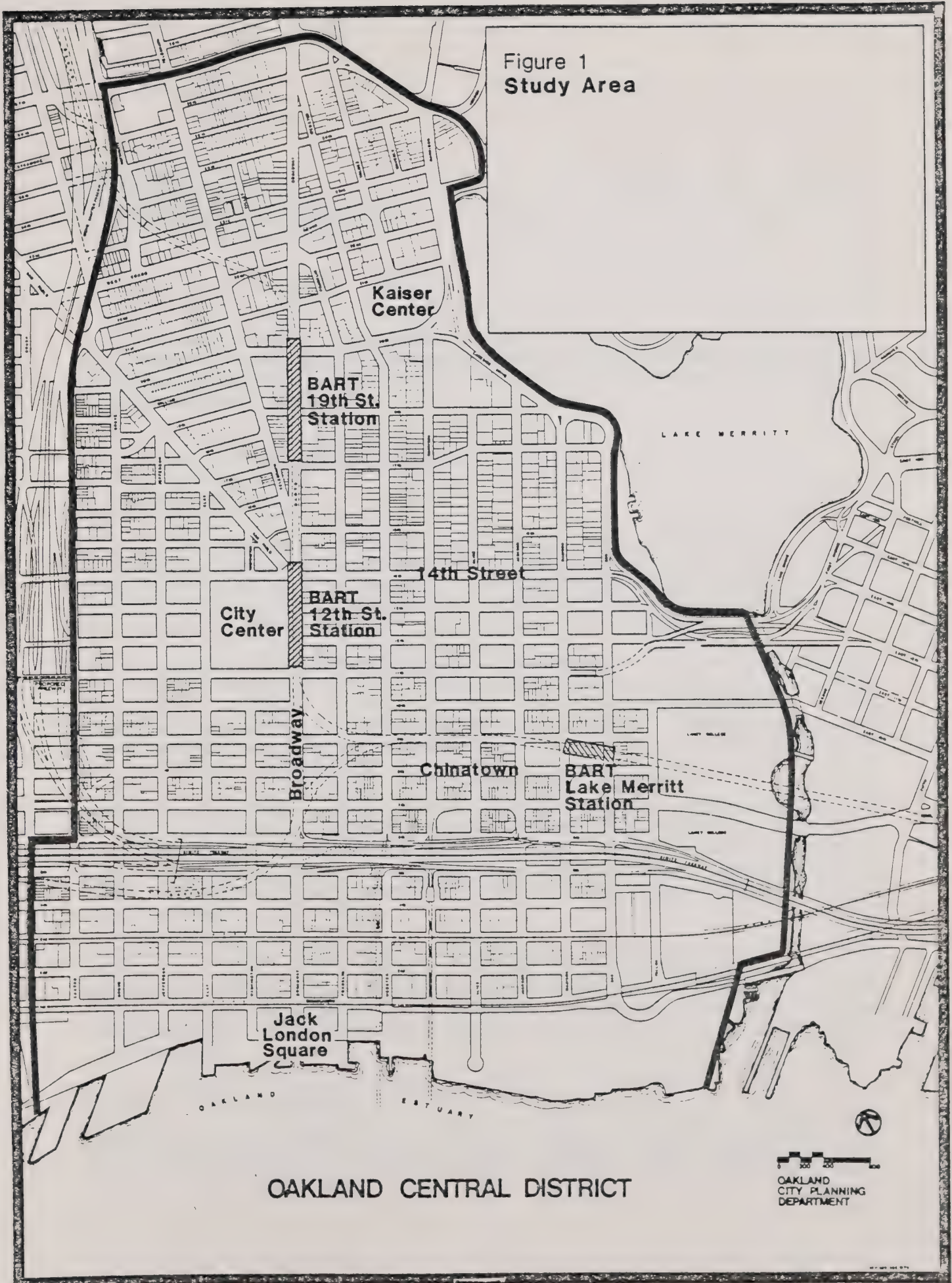
Two committees were formed to guide Phase I: a Technical Advisory Committee made up of representatives of affected agencies and transit operators, and a Citizen's Advisory Committee representing downtown citizen groups and businesses. Meetings were held with each of these groups throughout the study. It is anticipated that these two committees would continue to serve in Phase II so as to provide continuity.

PHASE I STUDY PRODUCTS

This Phase I Final Report is supported by several interim study reports and memoranda. These include:

- Issues Paper -- Includes analysis of projected transit needs, detailed discussion of transit issues, analysis of downtown development potential, and inventory of possible funding sources.
- Data Base Inventory -- Includes inventory and description of all relevant data sources and bibliography of recent studies.
- Summary of Case Studies -- documenting general investigation of transit achievements in six cities.
- Case study of Atlanta -- documenting detailed investigation of transit achievements in Atlanta, Georgia.

Figure 1
Study Area



Chapter II

PHASE I FINDINGS

As a framework for the Phase II study design, Phase I assessed downtown growth implications on the existing transit system; identified issues and concerns about transit service in the downtown; and formulated preliminary transit goals and objectives. Findings are presented below.

IMPLICATIONS OF DOWNTOWN GROWTH

Proposed Development

A survey of all known development proposals for the Central District indicates that there are some 18 million gross square feet (gsf) of offices on the drawing board today. This would almost quadruple the amount of downtown office space relative to today's estimated 6 million gsf. Additionally, about 1,000 hotel rooms, 2,000 residential units and 2 million gsf of retail space are under construction or proposed.

The development proposals tend to reinforce the existing concentration of development in two major nodes: one in the City Center area and the other in the Kaiser Center area. A third, but lesser node, would be created in the Jack London Square area. Modest growth is projected on the eastern side of the Central District. There is a notable lack of any identified growth in the Broadway corridor between the two major nodes despite the appearance of economic under-utilization in this corridor at present.

Individual project schedules call for the bulk of this development to occur within the next 10-15 years. Regional office growth projections by others, however, suggest that only up to 8 million gsf could be absorbed in downtown Oakland within the next 10 years or so. Even this reduced rate of growth, however, would double the amount of downtown office space. Under this scenario, occupancy of the full 18 million gsf now proposed would not occur until well beyond Year 2000.

Even excluding the 18 million gsf currently proposed, we estimate that there is under-utilized land within the CBD core area to support at least 33 million gsf of additional development. Therefore, the 18 million gsf of proposed development does not represent ultimate conditions or holding capacity. Moreover, there is some uncertainty (as well as some flexibility) in the future for re-orientation of land uses to optimize transit service and accessibility.

Potential Effects on Downtown Transit Service Needs

The potentially large amount of new development and its distribution over the Central District will have major impacts on transit ridership volumes, accessibility and dependency. The possible effects of downtown growth on future transit needs were

scaled by projecting increased PM peak period transit ridership out of the Central District due to downtown growth and comparing this to available capacity on the AC Transit and BART systems. Both the 8 and 18 million gsf growth levels were considered and some shift toward greater use of transit was assumed. Results are as follows:

- AC Transit: At the lower development level, a modest overall increase in bus service capacity is needed in order to avoid significant bus overcrowding during peak periods, and some spreading of the peak period would have to occur. At the higher development level, substantially increased transit capacity would be needed into and out of the CBD, even with maximum spreading of the peak period.
- BART: BART has projected a 70 percent increase in system capacity over the next 5 years or so due to a number of improvements now underway or planned. Even so, at the lower development level peak hour loads on the already overcrowded Daly City to Concord line would increase slightly. At the higher Central District development level, severe overcrowding would occur on this line. Part of the projected increase in both cases is due to downtown Oakland growth, and part is due to growth in San Francisco and elsewhere.
- Traffic and Parking: At the lower development level, several downtown routes are projected to be overcongested, including intersections toward the Northeast, the Nimitz Freeway (already virtually at capacity) and streets leading to the Webster tube. A major parking space deficit is also projected assuming that only proposed on-site spaces are constructed for new developments. At the higher development level, locations of overcongestion would be more severe and widespread and the peak parking deficit would be proportionately greater.

TRANSIT ISSUES

Considerable Phase I work effort focused on identifying transit and transit-related issues concerning the Central District. A complete listing and detailed discussions of the various issues are given in the previously submitted Issues Paper and its appendices. Essentially, the issues can be boiled down to four fundamental questions facing the Central District:

1. What is the appropriate role for transit in encouraging and supporting downtown development?
2. How can transit operations be optimized to most efficiently and effectively serve the Central District now and in the future?
3. How can the needed downtown transit improvements and operating levels be financed?
4. What policy framework is needed to achieve the desired results?

These four questions are discussed below.

I. Transit's Appropriate Role in Downtown Development

Transit service both influences and is influenced by other components of downtown development. Three major linkages are apparent:

- The amount of transit usage depends on traffic/parking capacity and vice-versa. Defining an appropriate balance between transit and auto usage (mode split) is perhaps the very first issue to be addressed. Preceding analysis of potential effects of downtown development on transit service needs presupposes significant shift toward greater transit usage in the future. Even so, a large deficit in parking is possible. In the absence of more parking being constructed, further shift toward transit use should occur. Without a sound means of financing, however, AC Transit and BART will be hard pressed to supply even the capacity needed for the assumed transit mode split, let alone a higher one. Conversely, if transit service expansion is constrained, a still greater number of parking spaces (and associated roadway improvements) would need to be constructed. If neither transit nor auto facilities are expanded, downtown Oakland could lose its competitive edge with other employment centers, and the levels of development now proposed may not be achieved.
- Transit and other modes all compete for the same limited downtown space. There is a need to develop a comprehensive downtown circulation plan that most efficiently serves autos, trucks and transit vehicles in the future; that establishes priority functions of each street; that provides good access to existing and future development; and that provides a consistent guide for land use development in the future. This is particularly important in light of increasing pressures for closure of downtown streets, potential changes in downtown traffic patterns due to the extension of I-980 to Route 17, and the projected growth in auto, truck and pedestrian traffic due to future growth. Accordingly, downtown transit planning must be closely coordinated with planning of traffic and parking systems.
- The amount, nature and distribution of downtown land uses affect the need for, and effectiveness of, transit service. The primary function of transit in the downtown is to attract and support the desired land use pattern and intensity by ensuring the needed level of access. Conversely, land uses should be located and developed in patterns that permit efficient transit operations. Future land uses are to some extent implied by the currently proposed developments in the Central District; they satisfy the projected office space market to Year 2000 and beyond. Even so, there is some potential for shaping future land use since there remains a large supply of under-utilized core area property and since several of the proposed developments are phased plans that could change in the future. This raises the questions of (1) what is an appropriate pattern of land uses to facilitate transit service, (2) to what extent can such land use patterns be promoted by means of zoning, parking or other regulations or incentives, and (3) what rates of downtown growth should transit be planned for? There is therefore a need for the City of Oakland to study future land uses within the Central District in conjunction with the Phase II transit planning effort.

2. How to Optimize Downtown Transit Operations

Another key issue deals with how to operate transit service most efficiently and effectively within the downtown area both now and in the future.

Generally speaking, AC Transit and BART provide high levels of transit service into and out of the Central District at present. Transit service is close to most downtown destinations and, with the exception of the BART Daly City-Concord line, sufficient capacity is available at all times of the day. However, several concerns about existing downtown transit operations have been voiced:

- Delays to buses occur at several downtown locations, particularly along Broadway, which is the most heavily used transit street in the Central District.
- Congestion is a problem at a number of downtown locations (such as 14th Street and Broadway, which is a major AC Transit transfer location) due to the presence of large numbers of persons, autos, trucks and/or buses.
- In the absence of financial assistance, AC Transit plans to discontinue the low productivity Downtown Shuttle to help reduce the system's operating deficit.

These concerns point to the need to consider revised downtown bus routings, provision of transit preferential treatments and other low-cost measures to improve downtown transit operations in the near-term future. Additionally, several other concerns about downtown transit operations are keyed to future growth:

- The need for greatly increased passenger capacity on AC Transit lines serving the downtown during peak periods, and for new lines. These are not currently being considered due to funding limitations. Low-cost measures to increase downtown capacity without increasing the system-wide level of operations (such as to redirect existing service from non-CBD routes to CBD routes or to increase productivity of existing service) are constrained by service policies and technical factors. It is not anticipated that these measures would be sufficient in themselves to meet future service needs with or without these constraints. Nor are funds presently available in the short-range for system expansion. This is an issue with technical implications that go beyond the Central District.
- The need for BART service improvements to benefit Oakland commuters. Depending on the rate of non-Oakland ridership growth, total growth on BART lines serving Oakland could outstrip the 70 percent capacity increase projected by BART to occur over the next five years or so. This would compound existing overcrowding on the Daly City-Concord line and make it particularly difficult for Concord-bound Oakland commuters in the PM period, as available seats and standing room would be taken by San Francisco commuters. Parking shortages at Eastbay BART stations would also discourage Oakland commuters in the AM period as they typically ride later than the longer distance San Francisco commuters. Also, it is not known whether the relatively minor downtown Oakland station improvements

planned by BART will be sufficient in the long term. BART is beginning a two-year System Performance Study to optimize the capacity of the existing system. The Phase II work effort should be coordinated with the System Performance Study and BART's short-range planning process to ensure that possible operating strategies to meet Oakland's future needs are included in BART's analysis and, in turn, that BART's capacity constraints and opportunities are reflected in the Phase II study.

- Future Downtown Bus Operations. The current downtown bus route configuration concentrates north-south service on Broadway and utilizes 12th, 13th and 14th Streets for most east-west service. This routing may not be appropriate now and in the future due to proposed street closures; increased auto, truck, bus and pedestrian volumes; and shifts in employment concentrations. Also, existing on-street and sidewalk congestion will become more widespread in the future as development occurs. Revised bus routings, as well as transit preferential treatments and capital improvements may be necessary. This issue should receive particular emphasis in the Phase II study.

3. Financing Downtown Transit Improvements

Substantial capital and operating funds are potentially needed for transit improvements to accommodate downtown growth. These improvements would be the responsibility of the City of Oakland, AC Transit and BART. A transit development plan must reflect realistic funding potentials and limitations for each affected agency. It must also reflect the competition for funding of other improvements in the downtown (traffic and parking facilities, sewers, etc.). A preliminary assessment during Phase I underscores the gloomy outlook at present, particularly for public funds, and the need therefore to examine both public and private funding sources for downtown transit improvements during Phase II.

- AC Transit will be financially constrained in the near future due to recent cutbacks in Federal funds, effects of Proposition 13 and the like. Even with continued fare increases in the future, AC Transit will be hard pressed to expand operations in the future to meet ridership growth in the downtown unless the funding climate improves.
- BART will face increased pressure on its operating budget in the near future. Moreover, BART lacks sufficient funding to finance some of the major capital improvements (e.g., purchase of additional cars) which are necessary in order to realize the system capacity increase planned for the near future.
- The City of Oakland is facing funding cutbacks that will greatly limit its ability to fund downtown transit improvements out of general funds. Tax increment financing is a possible source to consider further, but may already be largely committed to other projects.
- Alternative Funding Sources are generally from the private sector and involve either taxes or fees, such as payroll taxes, parking fees, fees on new development and assessment district fees. The City of San Francisco, for

example, has approved a fee on new development in the downtown and has also proposed an annual transit assessment on all downtown businesses; both are being challenged in court, however. The main questions here are whether the private sector in downtown Oakland would support fees earmarked for transit improvements; how much funding could be generated; and what projects would be eligible.

The need for additional capital and operating funds for Central District transit service improvements is largely attributable to future growth. Nevertheless, transit financing is an issue that must be addressed immediately. First, given the uncertain financial outlook for public funds at present, AC Transit will have difficulty in maintaining present levels of operation within the downtown. Secondly, capital and/or operating monies are needed to resolve the immediate transit issues discussed earlier. And, finally, if the City is to develop funding tied to future development, ordinances have to be established in the near term since many of the proposed developments are now going through the approval process.

4. Policy Framework for Downtown Transit Development

It is evident from the Phase I work that coordinated City of Oakland, AC Transit and BART policies to guide Central District transit development are needed. While coordination among staff of the key agencies has begun during Phase I, it will be necessary to extend this interaction to the policy level as well, and to define specific transit policies, based on Phase II results. Key policy needs that have been identified in Phase I include:

- A policy by the City of Oakland that defines the role of transit within the overall transportation system and relative to downtown development.
- A policy by the City of Oakland to give transit operational priority on downtown streets as necessary to ensure efficient bus operations in the future.
- A policy by AC Transit to give high priority to downtown Oakland transit service improvements in the future as ridership increases.
- A policy by BART to consider the unique needs of downtown Oakland within its overall system planning framework.
- A financing policy to support the above policies, including consideration of alternative private sector funding sources.

The Phase II work effort should delineate a set of transit service policies and their implications so as to provide the necessary input to policy establishment. This should be coordinated with land use, traffic, parking and other policies so as to define an overall development strategy for the downtown area. Implementation of a consistent set of policies for downtown Oakland transit service will require the active participation of, at a minimum, the City of Oakland, AC Transit and BART. Participation of MTC should also be considered. To facilitate this process, we recommend early designation of a policy-level transportation task force, led by the City of Oakland and building off this study's Project Steering Committee.

PRELIMINARY TRANSIT GOALS AND OBJECTIVES

Based on the Phase I analysis, a number of general goals and objectives are suggested below as a starting point. No relative priorities have been placed on them at this time. They should be refined during Phase II and finalized once downtown transit policies have been agreed upon by the affected agencies.

Preliminary Central District Transit Goals

1. Establish a balanced downtown transportation system that reflects the appropriate role for transit in supporting downtown growth and complementing auto, parking and other modes.
2. Ensure efficient downtown bus operations now and in the future. Consider exclusive transit lanes, signal progression and priority, stop placement, turn restrictions, improved construction lane traffic management, peak period curb parking restrictions, and other treatments.
3. Maximize the coordination between the City of Oakland, AC Transit and BART by means of an ongoing Policy Task Force, further transit coordination in downtown access corridors, and the like.
4. Increase AC Transit service capacity for downtown Oakland commuters to meet future needs.
5. Increase BART capacity for downtown Oakland commuters to meet future needs.
6. Provide adequate downtown transit facilities to support the future level of operations.
7. Develop the necessary funding for downtown transit improvements.
8. Establish a comprehensive policy framework to guide downtown transit development, including parking policies, traffic circulation policies and land use policies.

Preliminary Central District Transit Objectives

1. Maintain at least today's downtown transit mode split in the future.
2. Maintain at least today's level of downtown transit accessibility to employment in the future.
3. Maintain maximum passenger load factors on all lines into and out the the downtown as follows:

AC Transit	- 1.25 passengers/seat in the peak half hour
BART	- 1.30 passengers/seat in the peak hour

4. Maintain at least today's average downtown bus operating speeds in the future.
5. Seek public and private funding sources for financing downtown transit improvements.
6. Form a policy task force, along the general lines of San Francisco's Transportation Policy Group, to deal with downtown transit issues.
7. Implement a set of policies to guide downtown transit development.
8. Implement a set of development policies to encourage and facilitate transit usage.

STUDY NEEDS

The fundamental problem concerning Central District transit provisions is that the area could be on the verge of a rapid growth cycle for which the City of Oakland, AC Transit and BART are not fully prepared. The Phase I analysis has helped to define the nature and scale of the problem, as well as to set forth the many issues to be considered when developing solutions.

Phase I falls short of offering solutions, however. This requires a more thorough data base, development and evaluation of a broad range of alternatives, and detailing of a transit development plan. These are the objectives of Phase II.

Beyond this, there is a need to supplement the Phase II transit study to consider:

- Other aspects of downtown development such as land use and urban design, traffic circulation and parking
- Supporting AC Transit and BART system improvements outside the Central District. (For instance, if commuters can't find parking at suburban BART stations and do not have adequate feeder bus service, they won't use BART for access to the Central District even if there is capacity on the trains themselves.)
- Development of detailed plans for selected transit improvement projects, including environmental documentation (at a subsequent date).

Central District Development Program

The reciprocal relationship between land use and transportation-- i.e., travel demands are generated by land use and, in turn, transportation facilities and services provided to meet these demands alter accessibility and therefore affect subsequent land use and development decisions--suggest an integrated planning effort in which transit programs are developed in concert with other land use and transportation planning and become one of several elements of the comprehensive plan. The advantages of this approach are quite obvious. Transit improvements can be made with a higher degree of certainty as to

future development patterns to be served; these improvements can be coordinated with other related street and parking improvements; and land use decisions can be guided in a manner which promotes convenient and cost-effective transit service. Additionally, a comprehensive approach would incorporate a Central District improvement program which would assign priorities to the various improvements and provide for a coordinated improvement schedule.

The basic tasks of the Central District Development Program are shown in Figure 2. Required EIR/EIS tasks, including documentation of existing conditions and documentation and assessment of alternatives, are made an integral part of the overall planning and decision-making process although such documentation is not included in the work program.

The initial data collection and compilation of each of the component efforts (land use and urban design, transit, traffic and parking) would provide the data needed for the companion studies. Information collected during this step should also be assembled in a format suitable for EIR/EIS requirements.

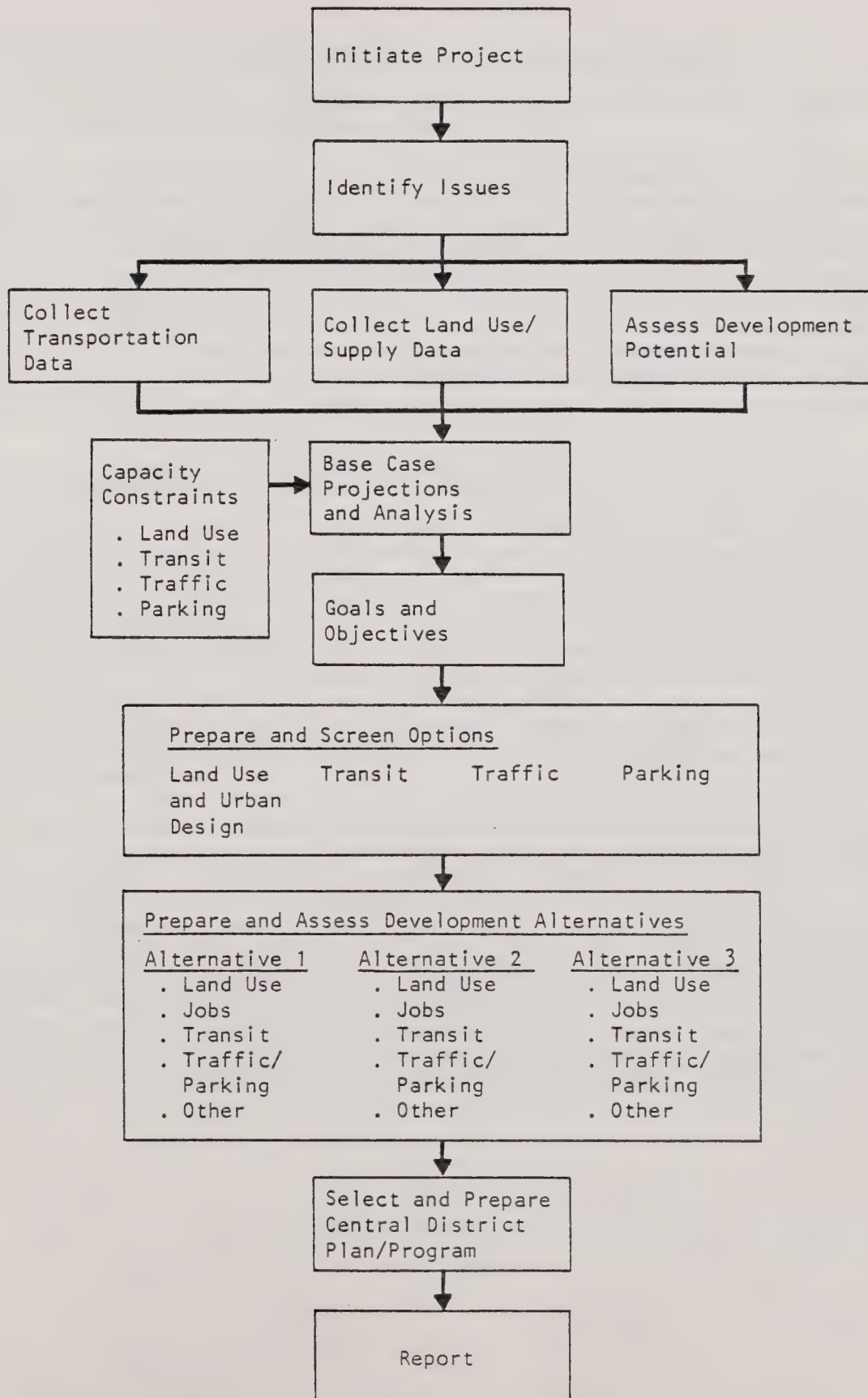
This step would be followed by documentation of a "base case" development scenario which would incorporate the findings of the land use study's growth projections with likely traffic, parking and transit service conditions and capacity constraints reflecting current policies and programs. This scenario would provide the basis for identifying specific issues which should be addressed in the overall program and also help sharpen the identification of the goals and objectives which should underlie the overall Central District program.

Following the refinement of goals and objectives for Oakland's Central District, each of the component studies would document specific land use/urban design and transportation options which should be considered. These choices would be subjected to an initial assessment to determine overall feasibility and effectiveness in achieving the selected objectives. Transit, traffic and land use/urban design options found to be worthy of further consideration would be compiled into several sets of complementary provisions representing either significant substantive differences or differences in strategy and programming approaches.

These composite alternatives would then be the focus of a more in-depth assessment to determine the collective effects of the various combinations of land use, roadway improvements, parking requirements, transit facilities and operations. This integrated assessment, which for example would provide the future mode split achieved by each alternative, would form the basis for selecting the final program direction. Each of the components would be refined and an integrated development program would be prepared for the Central District.

The final program should reflect implementation resources and priorities and should be readily achieved by regulation, capital improvements, funding mechanism, and development corporation(s) or other development entities. The program should be conceived to eliminate, to the extent legally possible, the need for environmental impact reports in the Central District. The impacts will have been taken into consideration in advance of development applications by the identification and evaluation of alternatives as described above.

Figure 2
Work Flow - Central District Development Program



Relationship of Transit Study to Central District Development Program

The Phase II transit study work program described in the next chapter is designed to fit into the CDDP, building off the Phase I study.

Phase I has accomplished some of the early transit-related tasks of the CDDP, including identification of issues, data collection, and a first cut at base case projections and goals and objectives. The Phase II work program will need to fill existing gaps in the transit data base. Phase II will also review and refine the base case analysis and preliminary transit goals and objectives in conjunction with the other CDDP study components. Subsequent CDDP work tasks — options screening, alternatives evaluation and plan preparation -- will be carried out in the Phase II study in conjunction with the other CDDP studies. This will require careful coordination of schedules among the various studies as well as frequent interaction among study participants. Since some of the initial transit work tasks have already been accomplished, some lead time will be needed for the other CDDP components.

Transit Planning Requirements Outside the Central District

Not all the major issues uncovered in Phase I can be adequately addressed within the strict confines of a Central District study. In particular, there is need for AC Transit and BART staff to assess, at least on a general level, transit system improvement opportunities and constraints, as well as the potential for further service coordination between the two systems, in corridors leading to the Central District. This gets into questions of suburban BART station access limitations, BART system capacity, AC Transit corridor service levels, types of operation and routes, and the like. The Phase II study can provide valuable inputs to AC Transit and BART on both short range and long range transit ridership growth and associated needs for Central District access. However, it would be desirable for AC Transit and BART to judge how best to deal with these access needs.

The proposed Phase II work program therefore includes a task wherein AC Transit and BART staff would evaluate corridor transit improvements to meet the Central District growth projections. The Phase II analysis would identify the total amount of transit ridership growth in the Central District and allocate this to general transportation corridors outside the Central District based on the projected regional distribution of travel (e.g. toward the south, north, east, west). AC Transit and BART staff would judge how much of the overall projected travel should be assigned to each system and, in turn, which downtown access corridors (e.g. MacArthur vs. Nimitz Freeway) and service types (e.g. express vs. local service) would best serve these demands. These judgments would then feed back into the Central District transit analysis, and would form the basis for allocating projected transit ridership onto routes within the Central District itself.

Chapter III

PHASE II STUDY DESIGN

This chapter describes the study framework for Phase II, specific tasks to be performed and the estimated schedule and costs.

STUDY FRAMEWORK

The proposed Phase II Work Program is designed to build off the Phase I analyses, providing the City, AC Transit and BART the necessary technical inputs with which to adopt a coordinated transit development plan for the Central District.

As explained earlier, the work program assumes that the Phase II transit study is performed as an integral element of a comprehensive Central District Development Program. Land use/urban design, traffic, parking and other elements of the Central District Development Program are assumed to be addressed in independent but closely coordinated studies. It is further assumed that AC Transit and BART staff will provide the necessary inputs on potential corridor and system-wide transit improvements affecting the Central District but outside its boundaries.

The proposed work program is essentially a linear process; it proceeds from general travel needs to a preferred transit plan, with frequent points of interaction with land use, traffic and parking elements. Plan evaluation and selection is based on a process that defines and screens alternative land use and transportation options; develops and evaluates complementary land use/transportation alternatives; and then selects and refines the optimum land use/transportation combination. This requires frequent coordination and interaction among study members throughout the process in addition to joint participation in TAC, CAC and other meetings.

STUDY AREA

The study area for the Phase II transit analysis is the Oakland Central District, boundaries of which are shown previously in Figure 1.

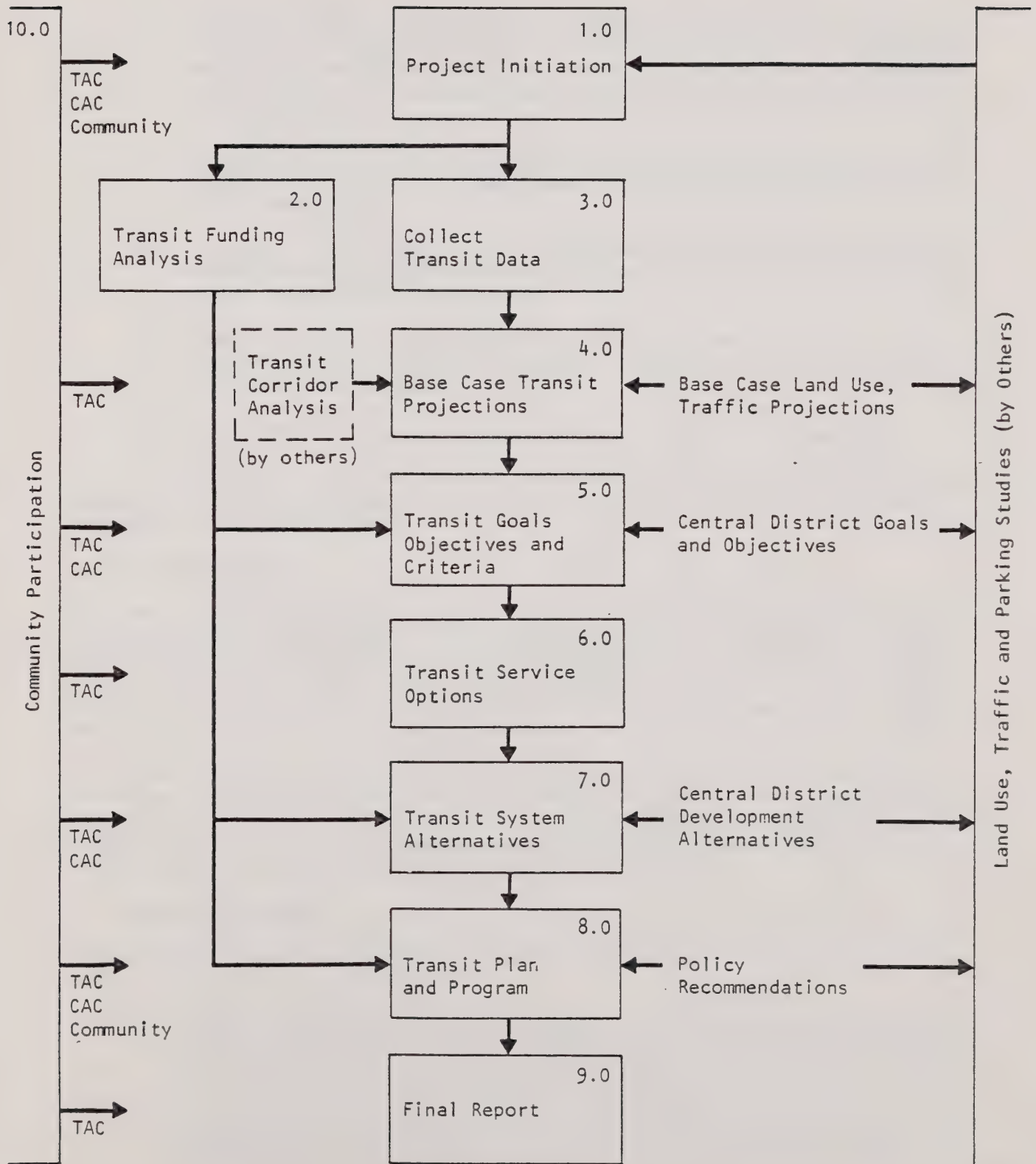
PROPOSED WORK SCOPE

Figure 3 shows the proposed Phase II transit study tasks as well as the linkages between them and to the companion studies. Individual tasks are described below.

1.0 Project Initiation

This task represents the start-up activities on the project. Available data will be gathered; the citizen participation process begun; and coordination established with other ongoing studies.

Figure 3
Phase II Work Flow



- 1.1 Assemble available information on existing and planned AC Transit, BART and private transit operations and downtown travel patterns, utilizing sources described in the Phase I Data Base Inventory. Include data on downtown transit routes, service frequencies, scheduled speeds, equipment utilization, stop locations, etc.
- 1.2 Coordinate with AC Transit and BART, including review of ongoing short-range planning efforts of both agencies, and of ongoing BART System Performance Study.
- 1.3 Coordinate with Central District land use, traffic and parking studies including review of work programs and acquisition of relevant roadway and parking information and projections.
- 1.4 Conduct initial meetings with Steering Committee, Technical Advisory Committee (TAC), Citizens Advisory Committee (CAC), and general community (see Task 11.0)
- 1.5 Refine Phase II study work scope, if necessary, based on the above tasks.

The product of this task will be a refined work scope reflecting community inputs and coordination with other ongoing studies. The work scope will be subject to approval of the Project Steering Committee.

2.0 Funding Analysis

This task will assess alternative funding sources for capital and operating costs of downtown transit improvements. An inventory and initial assessment of potential funding sources was completed in Phase I, including federal, state, local and private sector sources. Judging from Phase I findings, emphasis in Phase II should be placed on potential for tax increment funding and for private sector sources such as development fees.

The Phase I analysis will be updated and refined as necessary for evaluation of alternatives and for development of a financial plan for Central District transit improvements. Estimates will be made of the amount of funding that can realistically be generated; the types of eligible projects, potential implementation problems and general implications on affected parties will also be identified.

3.0 Augment Data Base

The purposes of this task are to update data and projections documented in Phase I and to collect additional transit data as necessary.

- 3.1 Review and evaluate existing AC Transit and BART operations within the study area, including locations and causes of bus vehicle delays, conflicts with other modes, adequacy of bus passenger loading areas, adequacy of BART station access, and physical constraints on service improvements. Maximum use shall be made of available AC Transit, BART and City information (such as the BART station access reports); peak period field observations and counts will be conducted where necessary to supplement this information.

- 3.2 Analyze existing peak period transit utilization by updating and refining Phase I Central District cordon and screenline analysis for existing AC Transit and BART services. Determine, for each transit corridor, the existing number of passengers, number of seats and resulting load factors across the study area boundaries and across screenlines drawn along Broadway and 14th Street. Maximum use of available AC Transit and BART data will be made; additional passenger counts will be made where necessary. This task will be coordinated with an equivalent cordon/screenline analysis of traffic flows in the concurrent Traffic and Parking Study so as to enable calculation of peak period modal splits.
- 3.3 By means of a sample on-board passenger survey within the study area, identify general transit travel patterns, including through-travel, transfers, and passenger origin and destination locations.
- 3.4 Identify major inter-line transfers on BART and AC Transit within the study area. It is anticipated that a limited field survey in the 14th/Broadway area will be needed to analyze transfers between AC Transit lines. This information would be supplemented by available BART and AC Transit surveys.

The product of this task will be an up-to-date information base on existing transit services and travel patterns within the study area.

4.0 Determine Future Transit Service Needs in Central District

This task will project future transit ridership volumes and patterns within the study area; identify potential future service needs and deficiencies; and document this analysis in an Interim Working Paper.

- 4.1 In conjunction with companion land use, traffic and parking studies, develop "base" case projections of peak period and daily transit trips for the short-range (5 year) and long-range horizons (year 2000), and assign to origin/destination zones within the study area.
- 4.2 From the 1980 Bay Area Travel Survey, Caltrans travel projections, ABAG population forecasts, and other origin-destination data, assign projected Central District transit trips to BART and AC Transit access corridors.
- 4.3 Project future Central District internal transit trips, transfers and through-travel by expanding existing counts on the basis of downtown and regional growth patterns.
- 4.4 Project "base" case future AC Transit and BART passenger load factors by corridor based on the above transit ridership forecasts and on future transit capacities planned by BART and AC Transit. Identify potential overloading and required transit service frequency and capacity increases (by corridor) to avoid overloading, based on current AC Transit and BART load factor standards. Also identify locations where capacity may be available for accommodating further growth. Submit results to AC Transit and BART.

- 4.5 Based on the above projections, judge how much of the overall transit ridership growth should be assigned to AC Transit and BART and, in turn, which downtown access corridors (e.g., MacArthur vs. Nimitz Freeway) and service types (e.g., express vs. local, etc.) would best serve these demands considering the potential for and constraints on AC Transit and BART system improvements.*
- 4.6 Based on results of Tasks 4.5 and with the assistance of AC Transit and BART, re-allocate projected transit trips between access corridors and modes (AC vs. BART) for subsequent analysis purposes.
- 4.7 Identify other impacts of future development on existing AC Transit and BART transit services in the Central District, including:
 - Bus operations (speeds, etc.)
 - Bus rerouting due to street closures
 - Transit proximity to new employment/commercial areas
- 4.8 Identify future needs of private operators (Greyhound, Continental Trailways, etc.) within the Central District, based on results of ongoing Oakland Transportation Terminal project.
- 4.9 Prepare and submit Working Paper No. 1 documenting results of Tasks 2 through 4.

5.0 Establish Goals, Objectives and Criteria

Phase I suggested a number of goals and objectives for transit service in the Central District, based primarily on the issues raised. This task will revise these goals and objectives in conjunction with companion CDDP studies and establish a set of criteria to be used in subsequent plan evaluations. Criteria will include both transportation and land use impacts.

- 5.1 Revise transit goals and objectives suggested in Phase I to reflect projected downtown transit needs and constraints from Task 4.
- 5.2 Establish a set of evaluation criteria to reflect the preliminary goals and objectives in Task 5.1. Criteria should include transportation capacity, accessibility and mode split; transit operations; impacts on existing and future development; compatibility with traffic and parking systems; costs; and implementation potential.

* Task to be done by AC Transit and BART staff utilizing ridership projections from Tasks 4.1 through 4.4.

6.0 Develop and Screen Transit Service Options for the Central District

This task will identify and evaluate, on a general level, a broad range of alternative transit service options for the Central District. Its purpose is to screen out inappropriate operating strategies based on year 2000 service needs and constraints. This will reduce the number of alternatives for combining with other downtown options and for more detailed evaluation in the next step. At this broad level of analysis, the service concepts focus on AC Transit operations; BART service improvements are considered later.

6.1 Develop alternative AC Transit/BART service concepts for Central District, including:

- Maintaining existing AC Transit routes except where future street closures have been approved.
- Dispersing bus service onto more east-west and north-south routes to form a grid network.
- Concentration of bus service into one or more north-south and/or east-west corridors.
- Radial system with downtown transit terminal.
- Radial system with peripheral transit terminals at each end of the Central District, and downtown distribution service via shuttle bus.
- Rerouting of downtown end of bus lines to provide distribution loop.
- Alternative route modifications for the Downtown Shuttle.

6.2 Screen the above alternatives on a general level, comparing effects on transit capacity and service accessibility, operational efficiency, other traffic, costs, future development and implementation potential.

6.3 Prepare and submit Working Paper No. 2 documenting the various transit options and their initial screening.

7.0 Prepare and evaluate transit service elements of Central District Plan Alternatives.

This task will package and assess in more detail the transit service concepts selected above. Short-range improvements will also be developed and evaluated. Results will be documented in a working paper, and will be the basis for selecting a recommended package of short-range and long-range improvements.

7.1 In conjunction with companion land use, traffic and parking studies, and based on the above screening of options and on inputs from the TAC and CAC, select transit service options for up to three Central District Plan alternatives.

- 7.2 Identify in sufficient detail for comparative analysis the specific improvement elements (short-range and long-range) for the selected transit alternatives. The range of improvements will depend on the concepts being considered and may include:
- Transit preferential treatments along Broadway and/or other transit routes, including mall, transit lanes, signal priority, etc.
 - Bus turn outs and loading areas
 - Revisions to intersections and roadways to improve bus operations
 - Improvements to passenger waiting areas (e.g., sidewalk widening)
 - Candidate sites and conceptual plans for a bus terminal, transfer centers, and fringe park-and-ride facilities in the Central District.
 - Potential BART station pedestrian and bus access improvements for the 12th Street, 19th Street and Lake Merritt stations.
- 7.3 Evaluate the selected short-range and long-range alternatives using the transportation and land use criteria established in Task 6.2.
- 7.4 Prepare and submit Working Paper No. 3 documenting results of Task 7, including descriptions of the selected alternatives and their evaluation.

8.0 Recommend Central District Transit Plan and Program

This task will select and refine a recommended transit plan and program for the Central District based on the above evaluations and on TAC and CAC inputs.

- 8.1 Select and detail low-cost, immediate action transit improvements to address existing transit needs in the Central District, consistent with recommended longer-range improvements.
- 8.2 Select and detail a recommended short-range Central District transit improvement program (5 year horizon) for incorporation by AC Transit and BART in their short-range planning process, including:
- AC Transit service improvements
 - BART Station access improvements
 - Transit priority treatments and passenger facilities
 - Major transit capital improvements
 - Implementation plan (improvement priorities, schedule, responsibilities)
 - Contingency actions
- 8.3 Develop general recommendations for a long-range transit service strategy for the Central District to support projected growth levels.
- 8.4 In conjunction with companion land use, traffic and parking studies, recommend land use, development and transportation policies and guidelines for the Central District to maximize AC Transit and BART efficiency and effectiveness.

- 8.5 Develop a financing plan for the recommended Central District service improvements. The plan will include preliminary estimates of operating and capital costs of the improvements and will recommend funding sources and financing methods. It is intended that these will be suitable for planning and decision-making for Central District service improvements but not for budgeting of specific projects.

9.0 Prepare Final Report

Fifteen (15) copies of a Draft Final Report will be submitted for review and comment. One hundred (100) copies of the revised Final Report will be submitted. The Final Report will document all analyses and findings of the study, and will present the recommended Central District transit service plan and program, and financial and policy recommendations.

10.0 Community Participation

This task will implement a community participation process for Phase II, building off the Phase I efforts and integrated into the overall Central District comprehensive planning effort. Specifics of the program should be defined during project initiation in conjunction with the companion land use, traffic and parking studies. (Task 1.0). It is anticipated that this process will continue for the duration of Phase II and may include the following activities:

- Periodic (about bi-monthly) meetings with the previously established Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC). Meetings will be keyed to need for inputs, review of study products and interim decision points.
- Community meetings to solicit inputs and comments from a broader audience, including affected residents just outside the Central District. One could be at the outset of Phase II to confirm the previously identified issues; to help prioritize the issues; and to solicit early inputs on possible alternatives and constraints. Another could be scheduled later in the study to obtain inputs and comments on the various alternatives being evaluated.

In addition to the above community interaction, frequent coordination with the companion land use, traffic and parking studies, as well as with the City, AC Transit and BART, will be critical to the Phase II work effort.

PHASE II LEVEL OF EFFORTS AND COSTS

The estimated level of effort to complete the above described work program is given in Table I. This is a preliminary estimate to accomplish the full work program, and includes professional, technical and clerical effort. It excludes in-kind services to be provided by participating agencies. This initial estimate may be modified to reflect desired work products, priorities and available study funding. To assist in this review, levels of effort are shown by task.

Table I
ESTIMATED LEVEL OF EFFORT REQUIRED FOR PHASE II

<u>Task</u>	<u>Estimated Person Weeks</u>
1. Project Initiation	2
2. Funding Analysis	6
3. Data Collection	5.5*
4. Transit Projections	10
5. Goals/Objectives	1
6. Options Screening	6
7. Plan Evaluation	17
8. Plan and Program	10
9. Final Report	4
10. TAC/CAC/Cordination Meetings	5
11. Project Management	<u>5</u>
TOTAL	71.5

* Excludes survey collection costs.

A rough estimate of maximum consultant cost to complete the Phase II study is as follows:

Labor-related	\$125,000
Other expenses	<u>20,000</u> *
TOTAL	\$145,000

* Includes survey costs (Tasks 3.3, 3.4) and Final Report Reproduction.

These estimates are all-inclusive costs based on the levels of effort shown in Table I and include salary, overhead, direct costs and profit.



The proposed work program is an ambitious one that addresses as many of the identified issues as possible and that provides a solid analytic base for decision-making. If available funds are insufficient, it will be necessary to scale down the work program by eliminating or curtailing level of effort and analytic detail in some tasks. It is stressed that this should be done by reducing or eliminating specific tasks, based on perceived priorities, rather than by pro-rating among all tasks.

PHASE II SCHEDULE

The Phase II schedule is largely dependent on scheduling of the overall Central District planning study. It is anticipated that Phase II will take approximately 12 months to complete to point of submittal of a Draft Final Report, as follows:

A.	Project Initiation/Data Base (Tasks 1-3)	2 Months
B.	Analysis of Future Needs (Tasks 4-5)	3½ Months
C.	Alternatives Analysis (Tasks 6-7)	4 Months
D.	Plan Development/Documentation (Tasks 8-9)	2½ Months
Total		<u>12 Months</u>

This schedule assumes 2-3 week agency review periods on interim study products and no delays due to coordination with companion land use, traffic and parking studies.

The subject of this report is the study of the physical properties of the liquid phase of a certain substance. The purpose of this study is to determine the effect of temperature on the physical properties of the liquid phase of the substance. The study is carried out by measuring the density, viscosity, and refractive index of the liquid phase of the substance at various temperatures. The results of the study are presented in the following tables.

TABLE I

The following table shows the results of the study of the physical properties of the liquid phase of the substance. The results are presented in the following tables.

Temperature (°C)	Density (g/cm³)	Viscosity (cP)	Refractive Index (n _D ²⁰)
20	0.85	0.5	1.35
30	0.84	0.4	1.34
40	0.83	0.3	1.33
50	0.82	0.2	1.32
60	0.81	0.1	1.31
70	0.80	0.05	1.30
80	0.79	0.02	1.29
90	0.78	0.01	1.28
100	0.77	0.005	1.27

The results of the study show that the physical properties of the liquid phase of the substance are affected by temperature. The density, viscosity, and refractive index of the liquid phase of the substance decrease as the temperature increases. The results of the study are presented in the following tables.